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THE bill authorizing the construction of the bridge designed by Mr. GUSTAVE LINDENTHAL over the Hudson River at New York City, has been passed by the House of Representatives. As designed it is to be a suspension bridge of 2,200 feet span, and at least 135 feet above high water mark, spanning the entire river between the towers located between the shore and the established pier lines in the States of New York and New Jersey. The bridge is designed for not less than six railroad tracks, with a capacity for four additional tracks for future enlargement. The bill states that the construction of the bridge shall be begun within three years and completed within ten years after the beginning. It is quite improbable that this bridge will ever be built, for its enormous cost as compared with tunnels of equal capacity gives the latter an immense advantage. Moreover, even this bridge would be more or less an obstruction to navigation, and nothing at all impairing the advantages of this harbor should be permitted.

THE meagre details of the accident to the "City of Paris" which have been received by cable do not warrant a discussion of its causes, nor of the means by which it might have been prevented, but enough is known already to enable a few conclusions to be drawn.

1. The transverse bulkheads have proved their ability to keep the vessel afloat, although both engine rooms were filled with water.

2. The longitudinal bulkhead between the port and starboard engine rooms was not strong enough to prevent an accident to one from rendering the other engine useless. This bulkhead should be strengthened, so that each engine room should be practically bomb-proof against the other.

3. There should have been valves in the circulating pipes between the engine room and the hull, which could be shut from the upper deck in case of the breakage of these pipes in the engine room. This would perhaps have prevented the filling of the engine rooms with water.

An accident such as this has its uses in advancing engineering knowledge. It is a great satisfaction to know that it was not attended with loss of life, and that the vessel did not go to the bottom even after it reached Queenstown harbor. When the full details are known there will be much learned discussion, which will cause precautions to be taken to prevent similar accidents in the future.

THE United States Senate has been wrestling for some time with the problem of framing a law against "trusts" or combinations that tend to restrict competition in trade. One difficulty which confronts the general government in legislation of this kind is the fact that while the Constitution gives to Congress the power to regulate interstate commerce, it does not give power to interfere with commerce within the limits of a State The latest form which the proposed bill has taken, as just reported from the Judiciary Committee of the Senate, avoids the difficulty by making it apply in commerce among the several States, or with foreign nations, or in the territories in which the general government has jurisdiction. The first clause of the bill reported by the committee says: "Every contract, combination in the form of a 'trust' or otherwise, or conspiracy, in restraint of trade or commerce among the several States or with foreign nations is hereby declared to be illegal." It fixes the penalty for making such contract or engaging in such combination or conspiracy at a fine of $5,000, or one year's imprisonment, or both, in the discretion of the court. One section of the proposed act says that any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared unlawful by this act may sue therefor, and recover three-fold the damages by him sustained, with costs of suit.

The proposed bill against trusts is much more limited in its scope than others which have been offered in Congress, and is more likely not to be found in conflict with the Constitution as infringing on State rights, but there is little probability of its passage.

The fact is that most of the Senators are financially interested in "Trusts" of the character they denounce in this bill. Senator SHERMAN, who introduced the measure is, we are reliably informed, interested in several such "combinations in restraint of trade."

"SCHMEIDBARENGUSS"

Newport, Ky., has acquired a rather unenviable notoriety as the home of the charlatan. The particular form assumed by the prevailing humbug was a lead furnace that would smelt all kinds of things and do wonders no other furnace ever did before. This was heralded as the invention of one CHARLES L. HARTSFELD, the company promoting the furnace being called the Hartsfeld Furnace & Refining Company. To give credit to the technical absurdities this inventor advanced, he caused to be printed on his cards the following puff which he asserted had appeared in the ENGINEERING AND MINING JOURNAL: "Mr. HARTSFELD has won fame as a builder of precious metal furnaces in Europe, and the merits of his present devices have already been recognized in many of our continental countries." We promptly published a statement in these columns that no such indorsement, or any indorsement whatever of this man or his furnace had ever appeared in the ENGINEERING AND MINING JOURNAL, and upon our request Mr. HARTSFELD promised to withdraw these circulars and cards.

We have recently received another circular of the Hartsfeld Furnace and Refining Company, in which this old indorsement appears credited to *The Engineering and Contract Journal*, New York, June 20, 1885. No such paper exists or existed at that time, and this is only a thin disguise, used with the hope of misleading the public into believing the ENGINEERING AND MINING JOURNAL had given him its indorsement.

Our opinion of Mr. HARTSFELD, president and manager, and of the Hartsfeld Furnace and Refining Company, is that they are unmitigated humbugs, wholly unworthy of credit. They now pretend to produce aluminum in the old water jacket furnace which formerly did duty as a lead and copper furnace—a pretense without a shadow of foundation.

This concern has purchased aluminum from Col. FRISHMUTH, in Philadelphia, whose bills, we believe, were not paid, and has recently bought the metal from the Pittsburg Reduction Company, and has purchased alloys of aluminum from the Cowles Electric Smelting Company. What was thus purchased has been paraded and advertised as made by this Hartsfeld concern, and a new company is organized and the stock sold on this fictitious reputation.

Whenever one form of humbug has been exploited as far as it will pay-

a new one is started. We have recently received a new circular describing the virtues of "Schmiedbarenguss" (aluminum wrought iron castings). The same old water jacket seems to do duty for this also, and the new company is "The Schmiedbarenguss Furnace Company, of Newport, Ky.," with Mr. HARTSFELD modestly among its directors. A correspondent suggests that it should be called "The *Schneid*-barenguss Furnace Company." This concern buys aluminum in Pittsburg, and it is simply a new face on the old humbug. We trust none of our readers will be deceived by it.

It is needless to criticise in detail the statements made in the Hartsfeld circulars, the head of the concern who apparently edits them is evidently a charlatan without metallurgical knowledge and the concerns which start from that source are more or less humbugs, which pay their debts in some cases and in others do not. The "Schmiedbarenguss" is only the old Mitis mixture of aluminum and melted iron, and, so far as we have been able to ascertain, presents no novel features.

THE INCONSISTENCIES OF THE McKINLEY TARIFF BILL.

The MCKINLEY tariff bill now before Congress is one of the most important matters affecting the public, or would be if it were certain that it would be passed. Some of the changes proposed to be made by it in our present unjust and unequal tariff are steps in the right direction; but it must be confessed that the bill, as a whole, is injurious to the general interests of the country, and seems to have been framed rather with the view of still further increasing the cost of certain classes of products for the especial benefit of a small number of producers who are already among those least needing that assistance, and with the result of still further increasing the cost of living of the wage-earning classes. While there appears to prevail a very general impression that this bill will not pass the Senate, there is nothing in the recent action of that body to give any assurance of this, and those interested should, without delay, take steps, by petitions to Congress, public meetings, etc., to secure a modification of the injurious features of this unwise measure.

The proposition to maintain the duty on nickel ore, to which we recently alluded in these pages, has been partly abandoned, and the American owners of Sudbury deposits are to be permitted to bring in their ores nearly free of duty and to build up a great industry in this country. There are some who say that this result was attained only because these owners are for the most part wealthy Republicans, who can contribute to campaign expenses; but looking only at the outcome, we warmly approve this step, and only mention the prevalent opinion as to its motive because it illustrates the disgraceful condition into which the statesmanship of the country has fallen when every act which has a bearing, good or bad, upon the industries of the country, is widely believed to be inspired, or at least controlled, by pecuniary considerations; or, in other words, that our laws are made rather with the object of benefiting private interests than for the good of the people at large—the nation.

Another excellent provision introduced in this bill is that which permits a metallurgical establishment to become a bonded warehouse, by which means it can enter free of duty ores containing dutiable metals, and after treatment can export the resulting products instead of having to pay the duty on entry and collect the same, less 10 per cent., on exporting the products, as is now the case. This feature of the MCKINLEY bill, if enacted, will certainly greatly benefit the copper industry, for we long ago arrived at the point where we produce more copper than the country consumes and must export the surplus. This proposed measure, therefore, allows the treatment of foreign ores here with American fuel, fluxes and labor, and by relieving the business of the present charges and annoyances will put our metallurgical works in a condition to compete with foreign establishments on more equal terms. At the same time, since the products do not enter into our home consumption, no protectionist can complain. We have reason to believe that should this modification of our present tariff be adopted, whether separately or as a part of Mr. MCKINLEY'S bill, it will greatly increase the business of some of our copper works.

The lead smelting and the silver mining industries are not to be treated in this enlightened manner. The MCKINLEY bill proposes to prohibit the importation of lead fluxing ores by imposing a duty of 1½ cents a pound on the contained lead, and should this become law it would destroy or greatly injure existing American establishments, which represent many millions of dollars, and would drive American capital to Mexico to build up great rival establishments there, which would permanently affect the development of the industry here.

It seems strange that the enlightened policy which would reduce the duty on nickel ores, with the object of creating a new branch of the metallurgical industry here, would at the same time deliberately adopt a measure which would destroy works already established and employing vast amounts of American capital and many citizens. More than this, as we have frequently shown, and as is now nearly universally admitted, the free importation of Mexican silver-lead fluxing ores is of inestimable benefit to our American "dry" silver ore miners. The prices paid for these dry ores were promptly reduced when the importation of Mexican fluxing ores was lessened through the restrictions imposed by the Treasury "instructions" to custom house agents. Now we are pleased to see that the Leadville, as well as the Kansas City, and, we believe, nearly all the smelters that are not directly interested in Colorado carbonate mines, are protesting against the imposition of a duty on these Mexican fluxing ores.

As our Boulder, Colo., special correspondent says on another page, "Free lead ore from Mexico is what we need and must have, if we are to have our dry ores smelted cheaply."

DISCOVERIES IN THE GRAND CANON.

According to a private letter from Flagstaff, Arizona, the people of that place and vicinity, reaching to Prescott, Williams, Winslow, Albuquerque, and other camps, are very much excited over the discovery o what seems to be an extraordinary mine in the Grand Cañon of the Colo rado. Three men, Messrs. ASHURST, MARSHALL and MORRIS, started few weeks ago on a prospecting trip, and discovered the ledge which ha caused the boom. They are reported as declaring it to be as much greater than the Comstock as the Grand Cañon is greater than an ordinary gulch. Says the same correspondent from whom I quote (a lawye of standing, and a cool observer):

"All the old buck-boards, mules, horses, burros, and camping outfit that can be scared up in this community are now called into immediate use. Men have carried lumber miles and miles on their shoulders to make boats to cross the Colorado River to locate the ledge on the other side, which, they say, is plain to be seen for ten miles before you reach the river. ASHURST and MARSHALL tried to construct a raft to cross the river on, but came near being drowned and had to abandon the plan. —— wants to bet a hundred dollars that there will be more votes cast at the Grand Cañon than at Flagstaff at the coming election. They are in town now after a crew of men, forges, and outfit to go to work takir out ore."

Curiously enough, it did not occur to the writer of the above to say what kind of mine had thus been discovered. Perhaps the ledge in question will prove to be a deposit of lead-ore in some of the limestone strata, the nearly horizontal edges of which are exposed in the magnificent section of the Grand Cañon. This section begins at the top with the carboniferous, and extends through the silurian at the bottom, and into the archæan rocks. Of course, if any one stratum in it is everywhere ore-bearing, the exposed edge of it in the wall of the cañon may offer an outcrop for fifty or a hundred miles, or at least from one to another of the north-and-south faults which break the continuity of the strata edges, and divide into some five separate plateaux the table-land on the north side of the Grand Cañon.

There is, in fact, in the corresponding strata on the south side, at or near Cataract Cañon, such an ore-bearing limestone bed, which has been known for some years, and it is believed to contain large quantities of lead ore, not, however, if I remember correctly, very rich in silver. It has never been developed or worked in earnest, because it requires as an indispensable condition of profitable production the construction of sixty or seventy miles of railroad.

The same will undoubtedly be true, only in much greater measure, concerning similar mines discovered on the north side. If they should present inducements sufficient to justify their active exploitation, they can best be reached, probably from the line of the new railroad, which is to connect Manti, in Utah, with Flagstaff, in the great San Francisco forest, and Flagstaff with the mining districts to the south, and with Phœnix and Tucson. This road will cross the Colorado at the only practicable point, namely, Lee's Ferry. Until we learn the precise location of the new mines it is impossible to say just how they can be connected with it. But it is safe to say that they will get no connection southward by direct crossing of the Grand Cañon itself at any point.

Another conclusion is indicated by uniform experience hitherto, namely, that no bed of limestone is likely to be found uniformly impregnated over the area of many square miles with lead or silver ores. The deposits of these ores in limestone, or along its contact with other rocks, are of later origin than the inclosing rocks, and are due to infiltration and metasomatic action. Consequently, they occur in more or less irregular channels or cavities, and present ore bodies of varying size, shape and degree of concentration.

But it is also possible that the discovery which has caused so much excitement in Arizona is of gold. The archæan rocks are gold-bearing at Prescott, and there is no reason to doubt that they are so under the Colorado plateau. It is said that Major POWELL'S party found gold more than twenty years ago; and one member of that party, I believe, has been trying ever since to discover its precise locality.

I confess that the nature of the reported *furore* indicates a discovery of gold rather than of such ores as everybody knows must have capital and transportation facilities before they can be profitably exploited.

Really rich gold mines in the Grand Cañon would not, perhaps, wait for a railroad. But they would mightily encourage and hasten its construction. The north-and-south line to which I have alluded will im

measurably assist the mining communities of a vast region, by bringing them into connection with the timber and agricultural products of the San Francisco forest, the fertile valleys south of it, and the coal and other supplies which can be furnished from Utah. R. W. R.

OVERPRODUCTION OF FOOD.

Nearly a hundred years ago MALTHUS published in his Essay on Population the alarming theory that population tended to increase faster than the means of subsistence, and that if it were not for war, pestilence or other calamity the race would in time become subject to the danger of starvation on account of insufficient food production. His theory found wide acceptance among many political economists, but since his time the whole tendency of history has been towards its disproval.

Population has greatly increased since the time of MALTHUS, but instead of there being an insufficient supply of food, there is actually a plethora of it, and throughout the whole civilized world the food-producing portion of the population is complaining of poverty, due to the fact that the overproduction of food has brought low prices and destroyed all profit.

Mr. DODGE, the statistician of the Agricultural Department of the United States Government, says: There is almost universal complaint among farmers of all nations of the prevalence of low prices. The agricultural depression of Great Britain has probably been more severe than that of any other nation. A potent cause in this case is the competition from all parts of the world unrelieved by any taxation of imports. France and Germany are somewhat disturbed by similar complaints of unremunerative rural industry. Italy has also had occasion to make official investigation of the causes of agricultural depression. Other countries are vocal with similar cries of dissatisfaction with the proceeds of agricultural labor. So the trouble appears to be general in monarchies and republics, whether the monetary circulation is gold or silver or paper, and under the influence of various and diverse economic systems.

In the United States the increase of production of grain has been more rapid than the increase of population, and this notwithstanding the fact that the percentage of the population which is engaged in raising grain is growing smaller. The same is true of the increase of production of animal food. Mr. DODGE says during the 40 years from 1850 to the present time cattle have increased very rapidly; cows from between 6,000,000 and 7,000,000 to about 16,000,000; other cattle from scarcely 12,000,000 to more than 36,000,000. While sheep have doubled in numbers, the wool production has quadrupled. While the milch cows are almost three times as many, their average rate of yield of milk has probably doubled. The improvement of other cattle, through breeding and feeding, has reduced the time required for maturity and increased the weight of carcass to such an extent that the amount of beef produced annually in proportion to number of animals kept is immensely increased.

The fact is that population has not tended to outrun its means of subsistence since the time of MALTHUS due to a cause which he could not foresee, namely, the tremendous activity of the inventive genius of mankind during the present century, which has given us the perfected steam engine, the steamboat and the locomotive, improved our plows, harvesting and milling machinery, discovered new fertilizers, such as the phosphate rocks and the basic slag from the THOMAS-GILCHRIST steel process, and thereby diminished the amount of human labor necessary for the production, transportation, preparation, sale and distribution of food. The Suez Canal, modern steamships, the opening of the railroads of vast territories hitherto undeveloped in India, Egypt, Russia, Australia and South America, as well as in the United States and Canada, have all tended toward the cheapening of food in all the older and more settled districts, and caused in these the desertion of farm lands, the depreciation of their values and the distress of their diminishing agricultural population.

The result of all these tendencies is that a smaller percentage than heretofore of the population of the world is necessary to produce the food for the world's consumption. There must therefore ensue the discharge of a certain proportion of the population from the business of producing food, and their transfer to other branches of industry, such as manufacturing, building of houses and structures for habitation or adornment, professional, personal or domestic service, or to the ranks of non-producers, such as soldiers and gentlemen of leisure, among which latter may be included tramps and men seeking employment.

The food consumption of the world has a natural limit in the amount which can be eaten, while there is no such limit to the consumption of articles of manufacture, taken as a whole, including articles of use and of luxury, the practical limit to their consumption being found in the wealth of the purchasers. There is, therefore, room in the world for all who are discharged from agricultural pursuits, and who can fit themselves to be producers of other forms of wealth, or who can make themselves useful to mankind in other directions, in the wide fields of professional or domestic service, mining, manufacturing and art industries in general.

The depression of agriculture, which now troubles many countries, does not therefore mean any necessary diminution of the wealth of these countries. It is only a transition period through which mankind is passing, in which there will be a transfer of many food producers to other industries; just as there was a transfer when the railroad supplanted the stage coach. All such transitions are inevitably accompanied by distress to some portions of the community, but when the transition period has passed, and men have adapted themselves to the new conditions, it is found that the sum total of wealth has been increased.

RECENT ECONOMIC CHANGES.—II.

Dr. WELLS attributes the depression in trade to the cheapening influence which has followed the control which man has recently acquired over the forces of nature. He does not, of course, deny the efficiency of some of what is considered causes in producing the distress which has characterized trade since 1873, but he regards them rather as effects of the one universal cause than as secondary causes.

Foremost among these is overproduction. He quotes the definition of overproduction given in the majority and minority reports of the Royal Commission on the Depression in Trade, viz.: "One of the commonest explanations of this depression or absence of profit is that known under the name of overproduction, by which we understand the production of commodities, or even the existence of a capacity for production at a time when the demand is not sufficiently brisk to maintain a remunerative price to the producer and to afford him an adequate return on his capital." Again, "by overproduction we understand the production of commodities (or existence of the agencies of production) in excess, not of the capacity of consumption if their distribution were gratuitous, but of the demand for export at remunerative prices, and of the amount of income or earnings available for their purchase in the home market."

The authors of these definitions, by attributing the overproduction to the possession of the agencies, or the capacity for production in excess of the demand, virtually adopt the same lines of argument as Dr. WELLS follows. Overproduction may be the immediate cause of the distress, but overproduction itself as a universal plethora, and not as a local surfeit, such as economic history offers many examples of, is the effect of the mechanical facilities that steam and electricity have conferred upon every branch of trade and commerce. The same agencies have likewise stimulated overproduction by simplifying the transaction of business and exciting competition. In these senses, therefore, overproduction is a proximate, and not the ultimate cause, of the decline in prices, which has caused, and is still causing, such serious distress and disturbance.

But, be its position and influence what they may, the effect of the facility of production has certainly been to create overproduction; and overproduction has, beyond question, depressed prices, and low prices have ruined capitalists and distressed laborers.

The point of the greatest interest in the discussion now arises. New applications of steam and electricity resulting in ever greater economy continue to be made. If, therefore, the cost of production depends on the adoption of machinery and on progressive improvements in mechanical appliances, the cost of production must decline. Prices must drop to a still lower range, and the time be far distant when the disturbance in the produce and labor markets due to such serious shrinkage of values as we have witnessed during the last two decades, will adjust itself. If the same cause is to produce the same effect, when will the tide of low prices ever ebb?

Of course, Dr. WELLS, while admitting the temporary embarrassment occasioned by the decline in values, sees many compensating advantages and a decided balance of gain to society at large from low prices. But most business men, manufacturers, miners and laborers, whether rightly or wrongly, think their interests will be better secured by high than by low prices, and, so thinking, shape their efforts by means, legitimate and often illegitimate, to bring about that result.

The human element, therefore, intrudes itself into the calculation as a factor to be computed. The working classes combine to fix the rate of wages, to limit the hours of labor; they dictate who shall and who shall not be employed in any trade, and they determine the number of apprentices who may be educated as recruits to fill the ranks of the skilled workmen.

By union they have become politically powerful, and have compelled the national legislature to interfere with emigration and the State legislatures to pass enactments favorable to their interests, and therefore inimical to the unlimited rights of capital. And as recently the mechanic workers have combined with the agriculturists, they may succeed in bringing irresistible pressure to bear on the national and State legislatures, in favor of measures which they believe will raise the price of labor and of the products of the soil. All such measures may interfere with the progress of progressive cheapening, whether they benefit those who initiate them or not. While the laborer is thus endeavoring to protect himself against competition in the labor market, and restrict the freedom of the employer, with a view to raising the value of what he produces, and therefore his share in its production, the employer is using means which may be as reprehensible on sound economical principles, and as doubtful of success, to resist the downward tendency of prices. His combined

efforts are mainly devoted to restricting production and controlling sales for he is a firm believer in the law of supply and demand, as it affects prices. The theoretical economist may argue that trade unions and commercial trusts in one form or another have always existed, and have been instigated by the same aims, but that nevertheless the laws of trade have operated with resistless powers despite man's feeble interference. How far this is true it is difficult to prove. But it cannot, however, be denied that laws which operate through human agency are more or less under the control of the human will, and therefore are not to be classed with the laws which govern physical nature, and operate through physical agencies. If, therefore, the great body of mankind come to think that steam and electricity are becoming their masters, they will endeavor to devise means to reduce them to slavery, and subdue them to their service. Such endeavors may prove but partially successful, because of the lack of universal co-operation and divergence of views as to individual interests; but it is more than probable that they will interfere with the decline in prices, which Dr. WELLS' argument implies is inevitable.

There are other influences growing out of that very industrial revolution described with such a wealth of illustration by Dr. WELLS, which may lead to other consequences than those that have immediately followed, and which may falsify the conclusions he so confidently draws.

There is no doubt that the causes enumerated have produced universally low prices, and that overproduction is an effect and not a cause; but overproduction may sooner or later itself become an efficient agent in bringing about a reaction. For overproduction, excited by the facility with which production can be effected by the aid of steam and electricity, may so rapidly exhaust the more available stores of certain natural resources, that a stringency of the supply may eventually increase the cost of production and raise the selling price.

Even the regenerative products of nature will ere long feel the effects of the high-pressure system under which they are now won from the earth and converted to our use. The illustrations of cheap cereal production are drawn from the newer, not the older, prairie States. The soil of Dakota is still rich with the accumulated fertility of ages of decay. That of Ohio and Illinois has already been impoverished by a single generation of farmers. The necessity of returning to the soil what is taken from it, greatly increases the cost of wheat in the older over that in the newer prairie States, and must sooner or later falsify the calculations as to cost. While this cause of enhancement in cost is operating here, others are sure to come into play in the other great wheat fields of the world. Cheap labor in Russia and India compensate for distance and other disadvantages; but, nevertheless, these countries will not remain uninfluenced by the democratic impulses of the age, creating discontent with existing conditions and desire for a higher standard of living, which impulses steam and electricity everywhere convey and diffuse. This means higher wages.

At the same time that we are rejoicing over the low cost at which we produce our corn and wheat by robbing our fields of their fertility without returning any nourishment to the soil, we have turned vast herds of cattle over the valleys and hillsides of the West. In a half wild state they have increased and multiplied to such an extent as to drive the price of their lank, lean carcasses down to an almost vanishing figure. A two-year-old steer on the ranges of the southwest is to-day worth $5. But overstocking is as ruinous in the long run as overcropping. The dry grasses of the West do not reproduce themselves like the succulent herbage of the East; and besides, the hungry beasts, in their struggle for food, pull up by the roots the tufts of grass, which at best grows in bunches far apart, and thus destroy the ranges. Up to this point the result of raising and feeding cattle on the millions of miles of the Western public domain, allowing the natural grasses to be eating off, and paying nothing to the government for the privilege, has, of course, produced cheap beef. But such exceptionally favorable conditions cannot last long, and with their cessation there will naturally occur a rise in the value of meat.

Corresponding changes are taking place, though more slowly, in the *llanos* of Venezuela and the *pampas* of La Plata, and with a like result in the meat market of the world.

We have cited these few instances in support of our contention that certain reflex operations are taking place as a result of the very revolutions which steam and electricity have effected.

These reflex operations have a tendency to reverse the downward direction of prices, which has undoubtedly been the first effect of the universal application of steam and electricity to every branch of industrial enterprise. As to what extent they will be effective, it would be idle to speculate; but that they will be efficacious in checking the cheapening power of machinery cannot be doubted.

Steel and Iron Boilers.—The rapid substitution of steel for iron in boiler making in recent years is evidenced by the letter of a boiler maker to a St. Louis newspaper. He says "in 1887 I made about 125 steel and 125 iron boilers; in 1888 about 270 steel and 25 iron, and in 1889, out of 300 boilers, only two were of iron." Of 132 boiler plate mills in the country, only two are making iron plates exclusively.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Lucigen Light.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Referring to your article in the ENGINEERING AND MINING JOURNAL, March 22d, on the "Lucigen" light, you have evidently made a mistake as to the power required for producing the light. We claim that 10,000 candle power of light will only take about one horse power to run the air compressor necessary to supply the air, instead of 25 horse power for 2,500 candle power of light, as stated.

NEW YORK, March 29th, 1890. INDUSTRIAL LIGHT COMPANY.

The Mulatos Gold Mines, Mexico.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of Feb. 1 there appeared an article on the Mulatos mine, by Louis Janin, Jr. I was in Mexico when the article appeared, and only returned to this city a week ago, in time to hear the bad reports concerning the mine. As the writer of the article referred to is my nephew, and accompanied me as assayer when I last examined the Mulatos mine, in company with Mr. D. B. Gillette, Jr., in the spring of 1888, I think it not out of place, in view of recent developments, to state that his article was offered for publication, despite my earnest protest and expostulation.

I would also thank you to contradict the published statement that I was employed to examine the Mulatos Mine by Messrs. Hayward & Hobart. The examination was made for the Exploration Company of London, represented by Messrs. Smith & de Crano, and my connection with the matter ceased when Mr. Smith, after reading my report, declined to purchase the mine at the price asked—a decision I could only applaud. This occurred nearly two years ago. I have had no connection whatever with any subsequent negotiations, and I need only say that I am not at all acquainted with Messrs. Hayward & Hobart, and that in my report to Messrs. Smith & de Crano I express no opinion as to the money value of the property, nor do I make any calculation of profit in sight, the results of the examination not warranting any such positive figures.

The facts as to how Messrs. Hayward & Hobart became interested in the purchase of the Mulatos Mine are known here to many persons.

I will add that while my report embraced all the general data obtained during the examination it expressed only my individual conclusions, and not those of Mr. Gillette. Very truly yours, ALEXIS JANIN.

SAN FRANCISCO, March, 21st, 1890.

Proposed Nomenclature and Notation in Thermics.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It is rather late now, perhaps, to offer any suggestions in regard to Dr. Wurtz's scheme for a nomenclature and notation in practical thermics;* but one or two ideas have occurred to me upon which I would like to speak, if I have not been guilty of procrastination for too long a time.

Probably all who have had occasion to make practical themic calculations have felt the need of systematic terms and symbols; and, as an engeneering student, I am quite in sympathy with Dr. Wurtz, and fully appreciate the benefit to be derived from an arrangement such as he has proposed.

In regard to the unit of thermic temperature, the therm, and the corresponding calorific unit or cal.* I wish, however, to suggest that, as the absolute and, I believe, universally acknowledged thermometric unit is not the degree of any scale, but is the difference between the freezing and the boiling points of water, at standard pressure, equal to 100 degrees cent. or 180 degrees F., I wish to suggest the propriety of taking this absolute standard unit as the basis of the thermic nomenclature, the therm. The calorific unit would then be 100 calories or 180 F. degree units, nearly. Quantities expressed in these units absolute, as suggested, would be intelligible in all countries, and convertible into degree units, anywhere, by simply multiplying by the grade number of the adopted thermometric scale.

In high temperature and calorific calculations, the degree units are inconveniently small, and such work is considerably abridged by the use of the larger units, this being especially the case in calculations involving calorific values. In the latter, Dr. Wurtz suggests the necessity of a system of several larger units; but, if we make the cal=100 cent. degree calorics, then we would need the centocal only.

In these larger units, the calorific value of carbon, for example, per unit of weight in any country, becomes 81 cals., and that of hydrogen 340 cals., nearly; and for hundred weights, the values are the same numbers of centocals—numbers which are much more manageable than those in ordinary use, and which give results requiring no reconstruction to be intelligible anywhere.

The mechanical equivalent of the cal. is, in our measures, = 138,960 foot pounds, nearly = about 4¼ horse power for one minute. An engine transforming 25 cals. of heat per minute into available mechanical energy would be of a little more than 100 horse power.

I believe these large units are used by Bell in some of his tables and calculations. I have, for some two years, been using them in private notes and calculations, but without satisfactory names. More lately I have followed Professor Egleston in the use of the name "caloric" for the heat unit, applying the same to the larger unit here suggested.

It is to be noticed that these suggestions do not involve any change in Dr. Wurtz's scheme; the change being merely in the definition of the unit of thermometric temperature.

Can we not have, by common consent, a unit absolute, which, like the unit of pressure or atmosphere, can be everywhere understood and appreciated? CHARLES F. TORRANCE.

DAYTON, Columbia Co., Washington, March 22d, 1890.

* ENGINEERING AND MINING JOURNAL, December 14th, 1889.

GREATER CARRYING CAPACITY FOR THE BROOKLYN BRIDGE.

The ever increasing traffic on the bridge between new York and Brooklyn has long made it evident that greater capacity is needed, even now, and will shortly become absolutely indispensable. As our readers know, the bridge roads are now operated by a wire cable, to which each car is attached by a "grip," the switching at the terminals being done by locomotives, which are also used during the slack hours in the night to haul the cars across the bridge and thus give time for repairs and overhauling of the cables.

In the ENGINEERING AND MINING JOURNAL, April 28, 1888, we reviewed the system proposed by Mr. A. M. Wellington for increasing the capacity of the bridge road by using a single loop line instead of switching the trains as is now done, and we pointed out the objections to that plan. We now illustrate an arrangement of loops, which seems to overcome the chief objection raised to the Wellington plan, and to permit an immense increase in the number of trains that could be moved on the bridge. This plan uses two or three loops, which are operated by an independent cable system, the main bridge cable stopping outside the loop switches.

All trains will come in on the north side of the bridge, as shown by the arrow-heads, discharge their passengers on the north platforms, then pass around the loop, take on the outgoing passengers on the south platforms and run on to the main south track, where they pick up the bridge cable. Since there would be two, and, if necessary, three loop lines, and as the trains take these in turn, the intervals between trains on the main line need be only one-half or one-third the time necessary to discharge, pass around the loop and take on the passengers. It is therefore possible to use quite short trains, and run them at brief intervals without incurring the danger of collision between the incoming and discharging trains.

Under this plan there would be three main and three auxiliary or loop cables. During the long interval hours only one cable would be run, and as the traffic increased the headway of trains would be reduced, and then the other cables would be brought into service.

The Rapid Transit Cable Company has devised this system, and it proposes to employ a special motor with each train, this motor having an improved "grip," for which great advantages are claimed, among which are to be noted the facts that it can pick up a cable at any point, and should one cable get out of order the grip can be changed over in a few seconds to pick up one of the other cables. These features of having several (3) main cables and the ability to drop one and in a few seconds pick up another at any point on the road are extremely valuable, and may save many delays and possibly prevent some accidents on a road run with so small a headway (25 seconds) as is proposed for the bridge.

By the use of the very simple device of making the inside wheels of the cars with two diameters, the smaller of which come into play in going around the curve, when the wheels act as cones adapted to the radius of the curve, the tension on the axles is overcome, and an arrangement of horizontal wheels and guide rail protects the wheel flanges and rails from wear. By these means it is possible to pass easily round curves of 45 feet radius, thereby saving much space and the heavy expense for additional land which the loop formerly proposed involved. The following statements are based upon a report made to the Rapid Transit Cable Company by Mr. A. Bryson its able engineer. It is contemplated to use four and five car trains, and the main ropes running at a speed of 10 miles and 12 miles per hour. The accompanying tables are self-explanatory.

TABLE NO. 1.

Initial velocity, ft. p sec.	Theoret. time req'd to stop on max grade	Total time.	Distance passed, feet.
14.66	3.96	7.96	86.66
17.59	4.75	8.75	113.14
20.52	5.54	9.54	138.92

TABLE NO. 3.

Track.	Length.	Time seconds.	Tot. time M.	Tot. time Sec.
1 inside.	640	72.72	1	23
2	700	80	1	30
3 outside	760	86	1	36

Note to table No. 3.—To the time in third column 5 seconds are added for starting, and the same for stopping; result, fourth column.

DATA.

Cars 50 feet long, weight.....38,000 pounds.
Motor 20 " " " .....20,000 "
Maximum grade.....3.77 per cent.
" retarding force of brakes.....12 per cent. of train weight.

FORMULÆ FOR TABLE NO. 1.

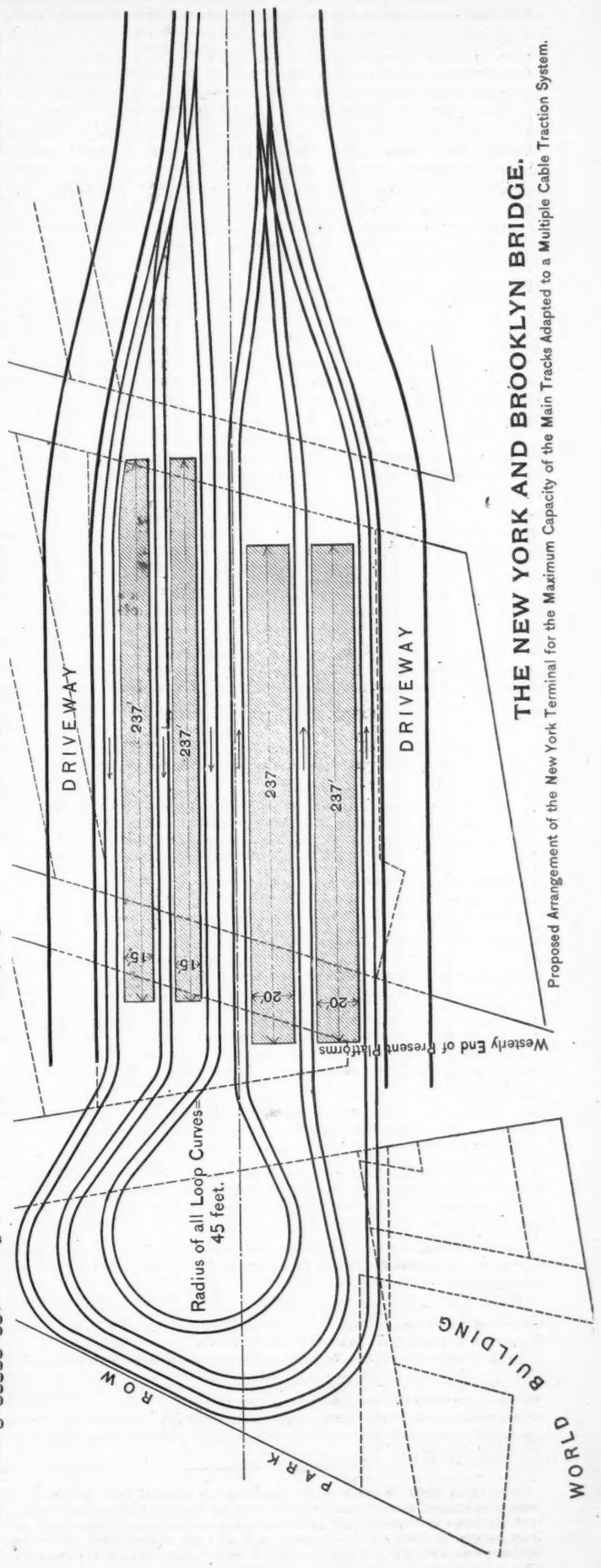
$$t = V \div \left(\frac{P}{w + w \sin a} 32{\cdot}2\right) \cdot \quad D = t\frac{v}{2} + c\,v$$

V=initial velocity in feet per second; P=retarding force of brakes in pounds; W=weight of train; a=angle of inclination of grade; t=time in seconds; D=total distance passed; C=constant as above=4 seconds.

TABLE NO. 2.

Speed. Miles, Hour.	Speed. Feet, Seconds.	No. of cars.	Headway. M. S.	Space bet. trains.	Number cars dispatched per Min.	Number cars dispatched per Hour.	No. of passengers carried per hour. 40 per car.	No. of passengers carried per hour. 100 per car.
10	14·66	4	1:15	880 00	3·2	192	7,680	19,200
"	"	5	"	830·00	4·0	240	9,600	24,000
"	"	4	1:00	659·90	"	"	"	"
"	"	5	"	609·90	5·0	300	12,000	30,000
"	"	4	0:30	219·8	8·0	480	19,200	48,000
"	"	5	"	169·8	10·0	600	24,000	60,000
"	"	4	0:25	146·5	9·6	576	23,040	57,600
"	"	5	"	96·5	12·0	720	28,800	72,000
"	"	4	0:20	73·2	"	"	"	"
"	"	5	"	23·2	15·0	900	36,000	90,000
12	17·59	4	1:15	1099·25	3·2			
"	"	5	"	1049·25	4·0			
"	"	4	1:00	835·4	"			
"	"	5	"	785·4	5·0			
"	"	4	0:30	307·7	8·0			
"	"	5	"	257·7	10·0			
"	"	4	0:25	219·7	9·6			
"	"	5	"	169·7	12·0			
		4	0:20	121·8	"			
		5		71·8	15·0			

Allowed for brakes to act, 2 seconds. Allowed for personal factor, 2 seconds.



THE NEW YORK AND BROOKLYN BRIDGE.

Proposed Arrangement of the New York Terminal for the Maximum Capacity of the Main Tracks Adapted to a Multiple Cable Traction System.

The maximum capacity of the bridge railway is reached when the distance between trains on the main track is just sufficient to admit of stopping a following train, should the occasion arise, without its colliding with one immediately in front. This distance depends on the weight of trains and the percentage of brake power; the grade and its direction, and the train velocity. There are also two constants to be added to the results theoretically deduced. One is the length of time required for the brakes to act, after their application by the operator. The other, a "personal factor," is the time elapsing between the operator's mental grasp as it were, of the necessity for a sudden stop, and the action he has to make to apply the brake. Two seconds have been allowed for each of these constants.

The maximum retarding force of train brakes noted at tests is 20 per cent. of the weight on the braked wheels, but to allow for unequally worn brake shoes and other possible minor defects, it has been assumed for the purpose of these calculations as only 12 per cent. The cars are 50 feet long; weight, 19 tons. The motor 20 feet long; weight, 10 tons. Maximum grade, 3·77 per cent. From the table (No. 1) it is seen that a train moving at the present cable speed of 10 miles per hour, under the conditions stated, can be stopped in 86·66 feet.

Table No. 2 has been prepared to show the maximum capacity of four and five car trains at various speeds and intervals, and from it we see that at the present cable speed, and trains dispatched at intervals of 25 seconds, with five cars in each train, the clear space between trains will be 96.5 ft. Whence the conclusion is reached that five-car trains can be run on 25 seconds intervals with safety, and the resulting capacity will be 12 cars per minute, or 720 per hour; or, counting 100 passengers per car, 72,000 per hour, against the present capacity of four-car trains on one minute and fifteen seconds intervals, of 19,200 per hour.

It is proposed to operate the loops at a speed of six miles per hour. The distance to be passed over by trains between the arrival and departure platforms, and the time consumed, is given in Table No. 3.. The interval between trains on the same *loop* track with 25 seconds headway on the main track will be 1 minute and 15 seconds, and the length of a five-car train and motor is 270 feet; so that the length of time which a train can stand at the loading platform before the following one is within striking distance will be, for track No. 1 (inside), 42 seconds; for track No. 2, 48·8 seconds, and for No. 3, 55·6 seconds. This is considered ample, and shows that the three-track loop is equal in capacity to the main line.

The arrangement of the loops at the New York terminus is shown in the accompanying illustration. The switches would, of course, be automatic, and proper precautions taken to prevent accidents from that cause. On the whole, we are disposed to consider this plan as practicable, and as offering very great advantages over the present system and over the loop line which was proposed two years ago; it may be made safe and has large capacity, with probably the minimum of cost both in land and in running expenses.

THE MINES OF CALICO DISTRICT, CALIFORNIA.

Special Correspondence of the Engineering and Mining Journal.

Calico mining district is situated in San Bernardino County, Cal., and is of peculiar interest to both the miner and geologist. An important feature of the district is the fact that the mines have been self-supporting from the date of their discovery, the ore, which is chiefly chloride, and chloro-bromide of silver, occurring in such quantities in the upper parts of the mineral veins and deposits that general attention was attracted to this district almost immediately upon its discovery in 1880. Since that time Calico district has been a constant bullion producer.

There are now operating in the district four mills, having in all 115 stamps, with a crushing capacity of about 300 tons daily. The monthly output is at present probably not far below $100,000, and may exceed this sum.

The crushing capacity of a stamp varies greatly in Calico district, as there is a very great difference in the character of ores from the various mines, and frequently in ores from the same mine. Indeed, I doubt if there is another district that can produce, in a limited area, such a diversity of ore, physically. Some of it is hard and flinty (jasper); some is soft, but brittle (calc-spar and barytes); other ores are soft and spongy, clogging the batteries ("tufa"), and some are sandy and quartzose.

The variety of colors in the ore and also in the mountain masses suggested the name for the district, "Calico." A massive mountain of red and violet rock is found flanked by a great band of pea-green tufa, and this by a buff-colored breccia, which in turn is overlaid by red and yellow conglomerates and porphyry.

The geology of Calico district is extremely interesting to the mining geologist, and will afford abundant opportunity for study. The proper time to visit Calico is in the winter, as in summer the visitor would prefer the shade of some friendly building or tunnel to climbing over the rugged, treeless slopes of the Calico mountains with the mercury marking 120 degrees in the shade.

The main range of the Calico mountains consists of an eruptive mass of violet-brown liparite, which in many places has been stained deep red by iron oxides. In order to account for the peculiar succession of rocks from the main or central core outward toward the desert plains below, there must have been at least three separate eruptions, with a considerable period elapsing between each disturbance. First the main nucleus, the violet liparite, followed by an accumulation of heavy beds of tufa—all purely volcanic. Some of the tufa is green, some is yellow, some bleached white, all being changed more or less by the pressure, heat and vapors incident to subsequent eruptions, and also partly by the agency of atmospheric influences.

Following this, another eruption occurred which resulted in forming an immense layer of rock, which rolled up within itself all the loose boulders and stones which lay in its way, forming a heavy deposit of conglomerate—a brecciated mass composed of the previously erupted material, in a paste of rhyolite.

After this eruption must have followed a long period of freedom from volcanic disturbances, during which there was a vast erasion of the mountains, sufficient to form, in the sea surrounding this volcanic island, beds of sandstone, shale and mud at least 1,000 feet in thickness, and probably much more. That this period was of great duration is evidenced by the fact that the water frequently became shallow, forming lakes of considerable size, which were evaporated on the mud flats, leaving deposits of gypsum and salt, and, in what is now called East Calico, a large and valuable residuary deposit of borate of lime remains to tell something of the early history of the district. These relics of the former lakes are followed by other heavy deposits of detritus from the mountains, which cover the borax deposit many hundreds of feet beneath the débris.

Again the slumbering fires were awakened and a new outburst of molten rock tore its way up from the regions far below, crushing, breaking and bending the rock formations on either side. This eruption consisted mainly of felsite, and extends from a point half a mile west of the Waterloo mine to the town of Calico. It seems to have found an easier passage between the ancient conglomerates and tufas and the more recent sedimentary deposits which were built up from the ruins of the former. The sedimentary beds are now found faulted, twisted and folded in every conceivable way. In some places one would think the rock was still plastic at the time of the later eruption, as the strata make the most abrupt bends and show the extreme effects of torsion without even cracking.

To the southeast of the town of Calico is a single hill of massive rock of grayish hue, which has been called hornblende-andesite. The joint planes in the rock show a greenish chloritic color, the result of the decomposition of the hornblende, probably.

A so-called "granite" has been found on the summit of a hill directly north of the Waterloo mine, but this I consider to be simply a coarser crystallization of the felsite, which occurs abundantly in the vicinity.

Not the least interesting part of Calico district are the ore deposits themselves, especially owing to their exceptional richness. The various forms of deposit are as numerous as the different kinds of ore. Fissures, blankets, chimneys, pockets and contacts all occur in this remarkable district. The later volcanic disturbances resulted in the formation of numerous faults, both great and small, some being single and others occurring in systems, being connected with each other.

The later disturbance was probably responsible for these fissures, cracks and gashes, as they are found in the "outside country" (as the sedimentary formation is called), as well as in the liparite, and as a rule the same vein filling (heavy spar) is found in both the old and the new formamations. Another reason for thinking that these spar veins resulted from the last eruption is, that, so far as I know, no barites has ever been found in the conglomerate, except in veins.

The ore is usually found accompanying the veins of heavy spar, and is sometimes of extreme richness. The fissures are of variable depths and lateral extent; some are large, others small. Again, a zone of rock between two fissures will contain pay ore throughout.

In some of the mines are found vast bodies of white and light green or yellow tufa, impregnated throughout with chloride of silver. Last fall it was asserted (at Calico) that in one of the mines the ore in sight, of this character, was worth $6,000,000. It was claimed that the ore body was 300 feet in length, 100 feet high, and about 40 feet wide, and that the rock would mill $60 a ton. The deposit in another mine was locally valued at a million and a half. I am not able to verify these rumors, but have reason to believe that large and valuable deposits have been opened.

Another form of deposit is the impregnation of considerable masses of sandstone with chloride, as at the Humbug and Bismarck mines.

At the Waterloo almost every class and grade of ore peculiar to the district are found. Here is a band of sediment metamorphosed by heat and pressure into a compact flinty jasper. Some small lots of this rock will mill from $300 to $1,000 a ton. A few feet distant is found a band of coarse sand rock of most unpromising appearance, but a closer investigation discovers it to be rich in horn silver. In another place we find the miners knocking down the roof of the stope with picks and hammers, no drills being needed. This soft stuff, looking like dried putty, is rich enough to send to mill, and some of it is of high grade.

The Waterloo is in the "outside" or "mud" country. This mine has a slip exposed in the workings, locally referred to as the hanging wall, which for regularity surpasses anything I ever saw. It extends in an easterly and westerly direction for several hundred feet, inclining at an angle of about 35 degrees from the perpendicular. It courses in a perfectly straight line, and the face of the displacement is as smooth and regular as a hard-finished wall. It is a wonder to all who have seen it.

Some of the greater faults seem to have had a direct influence in forming the topography of the country, as in Wall street cañon, which unquestionably was induced by the fault which runs along its length.

The source of the ore in the Calico mines is a matter to which little attention has been given. The silver is there, and that seems to be sufficient for most of those who have visited the camp. It is interesting, however, to note several points in this connection:

1. There are other hills of volcanic rock (identical with that of Calico) on the desert, extending from Lavic on the east to Acton and the head of Dead Man's Cañon on the west, a distance of at least 100 miles. Possibly these rocks have a much wider distribution. With the exception of the mines found at Calico and in that vicinity these liparites are not usually ore-bearing, as far as I have ever heard, and I have visited most of these volcanic hills.

2. The liparitic hills outside of the Calico Mountains, which include the Waterman's mine and the hills at Daggett, are not faulted and fissured as at Calico, and no veins of heavy spar are found.

3. The richest ores in the Calico district are found in the hills nearest the felsite eruptions.

4. All the felsite assays something in silver, and carries more gold than the liparites.

From these facts the general conclusion may be drawn that the felsitic and andesitic eruptions had a direct effect in causing the formation of the ore bodies of the district. The liparites probably carried appreciable quantities of silver previous to the felsite eruption, but the latter fractured the rocks in such a manner that planes were afforded for the free passage of solvent waters which, percolating through the masses of liparite and tufa, carried numerous solutions into these fault planes, where the action became more rapid and veins of baryta were formed, in the matrix of which the silver minerals were precipitated. Certain zones of liparite between two crevices became saturated, and here we find a rich ore body. In other cases, in either the liparite, the tufa, or the "mud," there have been local accumulations of ore, the silver contents of large rock masses

seemingly concentrating about a common nucleus. I believe that mineral solutions from the felsitic rocks aided largely in this formation of mineral deposits. In no other way can the very remarkable ore deposits of Calico be satisfactorily accounted for.

The "mud" country gives low assays in silver at almost any place; it is only in the region of extensive faulting and metamorphic action in the vicinity of the felsite that it is found to contain sufficient silver to make it profitable to work. Some of these impregnations or accumulations (there are both classes) are of high grade, running up into hundreds of ounces per ton.

Two and a half miles west of the Waterloo is the Langtry group of mines. The only thing worthy of mention in regard to them, from a geological standpoint, is the fact that, as far as developed, the vein exhibits every characteristic of a true fissure. The crevice is from two inches to 10 feet wide, and is largely filled with calcspar and quartz, carrying chloride of silver, iron oxides and some lead carbonate. The fissure is nearly vertical and cuts across the sedimentary rocks which lie almost horizontal. It is the only vein showing any considerable amount of calcite in the district.

Calico has always been self-sustaining and still possesses the elements of greatness and future prosperity, but no one has as yet been found who had the courage to sink deeper than about 400 feet. I believe the ore deposits extend to a much greater depth, but this needs to be demonstrated.

W. H. STORMS.

PASADENA, Cal., March 10th, 1890.

GOLD MINING IN WALES.

Written for the Engineering and Mining Journal by Thomas H. White.

The Welsh gold mines are situated near the town of Dolgelly (pronounced *Dolgethly*), the capital of Merionethshire, North Wales. Dolgelly is a somewhat noted summer resort, being picturesquesly situated among the hills on a small river near tide water, and only a few hours' ride by rail from Liverpool; it is reached by two or three different routes. Although many people were surprised a year or so ago to hear of gold mines in Wales, it appears that gold mining there is no new thing. I learn there was quite a gold mining excitement in 1860, an account of which is given in the following extract from a Welsh publication:

"Years ago there was a regular gold fever in Merionethshire. The fever began about the year 1860, and in this way: A Mr. Williams became the purchaser of the Vigra and Clogau Mines, which had been worked for copper for a considerable period; but Mr. Williams tried for gold. Curious stories are told of the hopes, fears, and disappointments of the owner and his manager, John Parry, when, one morning—it is said on the very day they had agreed to abandon the search, ruin staring them in the face—Parry made such a discovery as turned the heads of the whole community. The excitement was pardonable, for in a 'bunch' he found what was proved to be *thirty-six thousand pounds' worth of gold!* At once the fever raged. Nothing was thought of by day, or dreamed of by night, but

> Gold! and gold! and gold without end,
> Gold to lay by, and gold to spend,
> Gold to give and gold to lend,
> And reversions of gold in *futuro*.

"Mines were opened in various places, and hopes ran high. But after awhile the fever abated. The finding of the nuggets at Clogau was a piece of good fortune not to be repeated. True, that company did net a profit of £20,000 a year for two or three years after, but the other mines were soon abandoned."

After lying idle for 30 years, a year or so ago the attention of the mining world was again called to this district by Mr. Pritchard Morgan, who used considerable energy, and perhaps capital, for that purpose. He succeeded so well that a company was formed in London named the Morgan Gold Mining Company, Limited, with a paid up capital of £250,000, to purchase and work the Morgan gold mine, situated eight miles from Dolgelly. People flocked to the district in such numbers to see this gold mine that the company had finally to post notices that a charge of ten shillings would be made for every one visiting the mines and works. These notices are still posted and the order enforced, although I confess it was not in the case of your correspondent.

The Morgan Company has a Frazer & Chalmers 25-stamp mill, and is adding 15 more stamps, made by the Sandicroft works. It will be a nice, complete mill when finished; it is run by an 80 horse-power engine and outfitted with two Blake crushers, self-feeders, and six Frue Vanner concentrators.

The concentrators are not used at present, as the ore milled is free milling, but when the 40 stamps are complete the company expects to mill quartz carrying considerable iron pyrites, zinc blende and galena. Some of the concentrates already shipped to Swansea netted the company a profit of £2 10s. per ton. The cost of freight to Swansea from there is 7s. per ton. Coal at the railway station is 18s. per ton, quite a good price since the coal mines are situated not more than 50 miles distant. There are two veins worked on the Morgan mine; these veins run parallel and are about 240 feet apart. The mine is worked by three adit levels: the first vein reached is about 15 feet wide and the second one 25 or 30 feet wide. There are, however, only from three to six feet of each vein on the foot wall that pay to work, the balance being barren.

The train wagons on which the ore is loaded in the mine are sent down the hill, a distance of 1,000 feet, by a self-acting tramway, from the foot of which they are hauled over another tramroad into the mill, a distance of half a mile more.

The company has an American air compressor (Rand make) and six power drills. The air compressor is at present worked by steam, but a turbine wheel is on the ground, and will soon be in place near the mill to run the air compressors by water power. All the tools, machinery, etc., around the mine and mill, with the exception of the 15 additional stamps, are of American make.

The superintendent, Mr. J. W. Pender, is an American of the Western type, and often says funny things to the noble lords, M. P.'s and others constituting the board of directors. The mine foreman is also an American, and, no doubt, is a good miner, as everything in and around the mine appears to be done in a practical and workmanlike manner. He conducted our party, consisting of myself, Mr. Mercier, in the employ of Messrs. Bainbridge, Seymour & Co., and Mr. Bunn, acting manager of the Champion Reefs gold mine, and wished to impress us that all that glittered was gold, by showing us some very yellow iron pyrites in the lode for gold, but was quite non-plussed when I ventured to ask "if he was not mistaken, because to me it looked like iron pyrites." He evidently thought we were Londoners and had never seen a mine before, and as soon as he saw he was caught, and that we were not as green as we looked, he asked me "if I had seen a gold mine before." I saw gold in several pieces of quartz that I picked up on the dump; in fact, some were nice specimens. The sett or land on which this mine is situated is leased by the company, the surface from private parties and the mineral from the government. The government exacts a royalty of 1s. 6d. for each sovereign's worth of gold produced, and the government agent has to see all bullion weighed before it is sent away to be sold. The owner of the surface gets rent for his land, so you see the miner is not so untrammeled in his operations here as in America. The following is from the general manager's report for the six months ending December 31st, 1889.

Number of days mill ran during six months	107
Number of days mill was hung up	52
Total number of tons of ore mined	2,954
Total number of tons of ore milled	3,216
Total number of tons of waste mined	5,848
Ore on hand stored July 1st, 1889	400
Cost of mining ore and waste per ton	9s. 11¾d.
Cost of milling ore per ton	4s. 5½d.
Profit per ton	£1 15s. 9d.
Total production	2,478 oz. 4 dwts.
Approximate values	£8,673

And the above production is 1,091 ounces 12 dwts more than was produced the six months previous.

In January, 1890, the mill was running 25½ days; hung up 5½ days; ore worked, first class, 100 tons at 1 ounce per ton; second class, 1,104 tons at 4 pennyweights 14 grains per ton; average number of tons worked per day during the month, 47 and 5 cwt; total production of mine for the month, 1 bar, containing 352 ounces pure gold, estimated to net when sold £1.210; operating expenses of mine, £258 4s. 4d.; operating expenses of mill, £220 8d.: total operating expenses of mine and mill, £478 5s.; profit over operating expenses, £731 15s.; cost of milling per ton of ore worked, 3s. 7¼d.; cost of mining per ton of ore worked, 4s. 3½d.; cost of mining per ton of ore worked and stored, 3s. 9d.; cost of mining per ton of ore, including waste mined, 2s. 5¼d.; total cost of mining and milling per ton, 7s. 11¼d.; profit per ton over operating expenses, 12s. 1¼d.; tons of ore mined, 1,371; tons of waste mined, 713; tons of ore on hand and stored, 305.

The Champion Reefs gold mine is a property of 800 acres, situated three miles west of Dolgelly; it is also worked by a London company. It is at present erecting a Frazer & Chalmers mill of ten stamps, and two Frue Vanner concentrators, and an American millwright is building it. The company also has a Rand air-compressing plant and four Rand (Slugger) power drills. Everything in and around the mine seems to be done in a substantial manner. This company has several veins, the principal of which is the Champion Lode, about 10 feet wide, and the Prince of Wales Lode, three feet wide. This is clearly a concentrating proposition, the quartz containing, I should say, about 5 per cent. of concentrates divided in the following proportions: zinc blende 3 parts, iron pyrites one part, galena ¼, and copper ore ¼ parts. I could not get a color of gold in the pan from this ore dump, and I expect some of the owners will be surprised to find there is no gold on the plates after they have run awhile.

The company has now contracted with the firm of J. Taylor & Co., mining engineers, of London, to build a wire tramway from the mine to the mill, 2,300 ft. long.

The Clogan mine mentioned in the above extract is a small claim situated within the Champion Reef Company's sett, and the Champion Lode runs through it. There has been some dispute and difficulty between the two companies, which is in a fair way to be settled, if not already settled. This company has 12 men at work.

These are the principal mines at present, but there are many prospects. The topographical as well as the geological features of the country are similar to those of the Black Hills of Dakota. The veins occur in the older clay slate formation, which is cut by porphyry dikes, greenstone, etc., the same as in the Black Hills Miner's wages here are 3s. 6d. per day, just one quarter what they are in Dakota.

PENSILVA CORNWALL, March 17, 1890.

Cost of Recovering Sulphur from Alkali Waste by the Chance Process.—The Chance process appears to be an advantageous method for utilizing the alkali waste resulting from the manufacture of soda by the Leblanc process. In the Chance process lime is burnt in the ordinary way in kilns with coke, but the resulting gases, instead of escaping into the air, are pumped into vessels containing the waste calcium sulphide made into a creamy paste with water. The sulphureted hydrogen is expelled by the carbonic acid from the kilns, and is made to pass over heated oxide of iron. By careful regulation of the air supplied along with the gas the hydrogen alone is oxidized, and the pure sulphur is obtained in suitable condensers. Or, if it be preferred, the sulphureted hydrogen cna be burned in proper apparatus and reconverted directly into sulphuric acid, which is again used to decompose salt, and thus recommences the cycle. The lime burnt in the kilns is required either to absorb the chlorine expelled from the salt in case bleaching powder is manufactured, or to absorb carbonic acid in case caustic soda is required.

The cost of sulphur produced in this way is said to be about $7.50 per metric ton. The reacting influence of this process on the production of soda, it is said, would lower the cost-price of this about $6.00 per metric ton, as about 88 pounds of sulphur are used to manufacture 2,204 pounds of soda in the ordinary Leblanc process. The investment required to introduce the Chance process on a scale suitable for manufacturing 24,000,000 pounds of soda a year is said to be about $30,000, and it is further asserted that the saving accomplished thereby, in only one year, has in some cases exceeded that amount. The German patent office refused to grant a patent on this process owing to the absence of novel features in it. The figures quoted above are taken from a report, in *Zeits. des Ver. Deut. Ing.*, of a paper by Mr. Hofman and its discussion in the Mannheimer Bezirksverein.

SECTIONALIZED AIR COMPRESSOR DRIVEN BY PELTON WHEEL.

We illustrate in this issue a compressed air plant consisting of a pair of sectionalized straight-line air compressors, with a Pelton impact wheel upon each shaft of a size to give the required power under a moderate head of water, and with double nozzles for each wheel. The arrangement was designed by the Ingersoll-Sergeant Rock Drill Company, of New York, for a South American mine, where the necessities of mule-back transportation required that it should be sectionalized so that no single piece should weigh more than 300 pounds.

The advantages gained by placing the Pelton wheel upon the compressor shaft is a considerable item of economy in power and first cost. The readiness with which a compressor and its operating power may be set up for work in the mountain mining districts, as illustrated in this plan, will be not only much appreciated in the decreased freight and mule carriage, but the work of setting two machines and the maintenance of belt connection with its loss of power, are matters of the greatest importance in mining centers, where every pound of water must be made to do its utmost duty for all purposes.

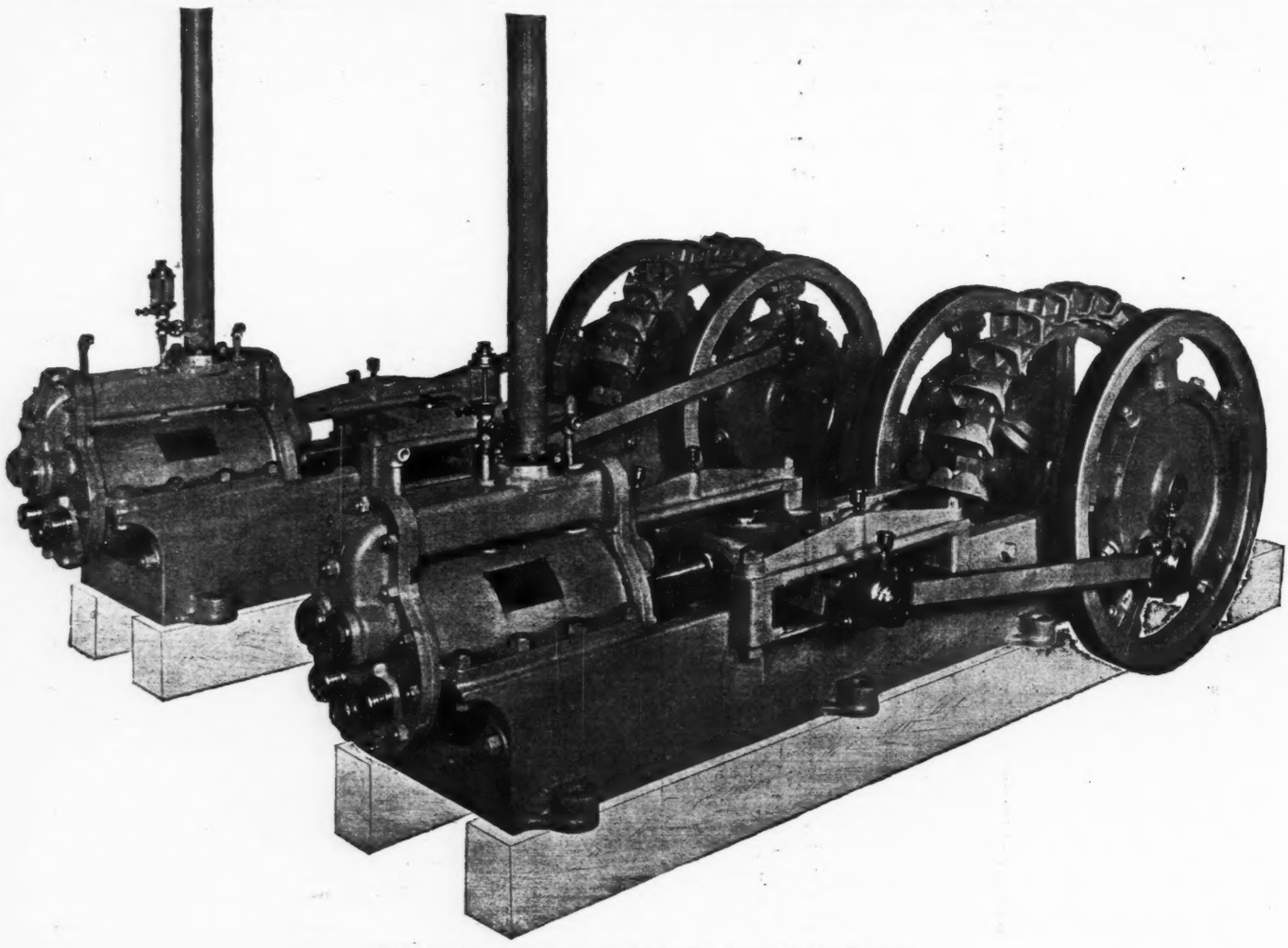


Fig. 1.—Sectionalized Air Compressor, with Pelton Wheel.

The work to be performed in this instance is driving a tunnel 100 miles east from Lima in the heart of the Andes, and the motive power is a mountain stream delivered through a sheet iron spiral riveted pipe 18 inches in diameter and 200 feet in length, with a fall of 50 feet. This is applied to each wheel by double nozzles, 3 inches each in diameter, as shown in Figs. 2 and 3, giving 120 revolutions a minute, which is a power sufficient for compressing air to 60 pounds pressure at an elevation of 10,000 feet above sea level. The air cylinders are 10 inches by 18 inches, water jacketed for the purpose of keeping them cool.

A High Chimney.—The Fall River Iron Company's 105 meter high chimney will soon be surpassed in dimensions by one about to be erected in the imperial foundry at Halsbruch, near Freiburg, Saxony. According to Mr. Huppner's plans it will be 138m. high, with an interior diameter of 4·80m. The pedestal is 12m., the shaft 8·70m. the chimney proper 117.30m., the total length of the flues 984m. The structure is to be built on an elevation of the ground 79m. above the workshops, and thus towering over these 217m. The height is intended to neutralize the poisonous effects of the gases.

Production of Artificial Horneblende.—Mr. Chruschtschur, St. Petersburg, Russia, is reported to have succeeded in the attempt to produce hornblende artificially. During two or three months he maintained in a heat of 550 degrees a solution consisting of dialyzed silicic acid, hydrated peroxide of iron, chloride of magnesium, muriate of ammonia and potash. —Chem. Ztg.

THE GEOLOGICAL SURVEY OF TEXAS.

Written for the Engineering and Mining Journal by Dr. Theo. B. Comstock.

There have been three distinct periods of popular interest in the discovery and development of the mineral resources of Texas. The first was in 1858, when a very well planned and carefully executed survey, so far as it went, was conducted under the management of Dr. B. F. Shumard. The vast extent of territory, meagre appropriations and hostile nature of the Indians, to say nothing of unusual political complications immediately preceding the Civil War, caused the results of the work to be fragmentary and scattered. Much of what was preserved is in the form of special papers, and there is very little in print which bears directy upon the economic situation. In 1870, a revival of interest enabled some superficial workers to draw salaries, but very little valuable material was gathered. An exception to this statement should be made in favor of Mr. Jno. W. Glenn (now of New Orleans), who was State Geologist of Texas for one year. His report was never printed,* and he resigned in 1874, owing to lack of support, after covering a limited area in Burnet, Llano and San Saba Counties in a thorough manner.

Until the present (or third) geological survey, under the direction of Professor E. T. Dumble, no systematic and comprehensive examinations with a distinctively economic purpose have been seriously attempted. Much exploratory mining work has been done in certain districts, but as usual in such cases, enthusiasm has outrun judgment, and lack of training for the work has resulted in disastrous speculation; in many instances where no real encouragement ever existed, but in other cases in places which could have been successfully worked under skilled superintendence. As a consequence, to-day, matters are at a standstill in sections where the resources are abundant enough, but where capital has either become discouraged, or cannot gain a foothold without paying speculative prices for undeveloped property. Fortunately, however, for the prospects of the country, there has been no unnatural booming, such as has wrecked the mining industry in some other States. With very few exceptions the people who reside in Texas, and those who have become interested in its supposed mineral bearing territory, have expended their own money in actual tests of the quality of the deposits, although many of these examinations have been conducted unadvisedly, and consequently at unnecessarily heavy expense.

The present geological survey has been organized but little more than a year, and the results of the field work of the past season are not yet fully elaborated. But four distinct areas have been studied with con-

*The writer has had access to Mr. Glenn's manuscript report, which has lately been unearthed in the archives of the State Department, Austin. Maps, sections and other papers of great value, referred to in the report, have not been found, however.

siderable care, and enormous collections are now in Austin, which are being overhauled and thoroughly worked up with the field notes. The organic act authorizing the survey makes it a branch of the Department of Agriculture, Insurance Statistics and History, but the able commissioner, Hon. L. S. Forster, who has the appointment of the State Geologist, has wisely left the details of organization and management in the hands of the appointee. The appropriation of $35,000 per annum enabled the State Geologist to provide for very satisfactory work over limited areas, and the museum and laboratory accommodations in the new Capitol building at Austin are superior to those furnished by many of the older and wealthier States. The organization of the survey for the season of 1889 was as follows: E. T. Dumble, State Geologist, in charge; W. H. Streemnitz, Geologist for West Texas; W. F. Cummins, Geologist for North Texas; R. A. F. Penrose, Geologist for East Texas (Tertiary, etc.); Theo. B. Comstock, Geologist for Central Texas (Pre-Carboniferous Geology); Robt. T. Hill, United States Geological Survey (Cretaceous Geology); Ralph S. Tarr, coal fields of North Texas; J. H. Herndon, P. S. Tilson, chemists; J.B. Walker, Curator of Museum.

The above divisions are arbitrary and do not clearly represent the work undertaken by each chief of division. Mr. Streemnitz has had charge in an area necessarily bounded by geographical lines, because the geology and intimate topography have not heretofore been made known. He has been engaged this season in detailed topographic work as a preliminary to geologic study, but the latter has been by no means neglected. Economic work of a general character has also claimed much of his attention.

The area covered by Mr. Cummins has been more distinctively geologic in outline, his work being confined to the great carboniferous and permian belts in North Texas. So, also, the geologists of the eastern area have practically had only tertiary and recent terrenes to work over, the cretaceous areas being in charge of Professor Robert T. Hill, of the University of Texas and of the U. S. Geological Survey.† The economic geology of the tertiary has been very carefully studied by both Dr. Penrose and Mr. Ladd. Mr. Ralph S. Tarr is now at work in the coal fields northwest of Austin, and he will examine the region in the neighborhood of the Guadalupe Mountains in the field season of 1890.

The district assigned the writer includes all the pre-carboniferous rocks of the central area, and is, therefore, a geologic rather than a geographic area, although it is conveniently designated geographically. In this field, known now as the "Central Mineral Region," it has been found necessary to go over the whole of the geology and topography and to work out some very complicated structure as a basis for estimation of the amount and character of the mineral resources.

Each field party has consisted of from three to seven or eight men, and all have done accurate topographic work, mapping contacts, and making complete detailed sections. The annual reports for 1889, to be published early in 1890, will comprise those features which may be of most general interest, embodying such conclusions regarding geognosy and mineralogy as can be worked out without doubt. For the biennial meeting of the State Legislature in 1891, there will follow more elaborate and well illustrated reports, having somewhat of a final character.

Through the kindness of Professor Dumble I am permitted to announce the following facts regarding the economic resources thus far discovered, the statements with reference to the central area being some results of personal observations, the notes upon other districts having been taken from the publications of the survey for the most part.

1. *Precious Metals.*—The occurrence of gold and silver in the central area is undoubted, but as yet neither metal has been profitably extracted. Assays of the material collected by the writer, while they do not indicate excessive yields in all cases, are encouraging enough to justify at least more thorough prospecting. Wasteful and reckless expenditure at the instance of enthusiasts with little knowledge of mining or minerals, has given the district an undeservedly poor reputation among investors, but unjustifiable excitement over the meagre developments already made has retarded rather than aided progress. Some high-grade silver minerals have been mined in small quantities, and in several places crude furnaces have been erected, but none are now in working order. The distribution of the ores is coincident with those of lead and copper mentioned below. *Tetrahedrite* and similar "grey copper" minerals are certainly present. Pockets of rich gold ore have been opened, but more exploration is needed to determine their distribution.

The southwestern area is yielding tangible results, and the reports which come in from the members of the survey engaged in that region are encouraging. ‡ In obedience to instructions from the Legislature, Professor Dumble has had the mineral regions surveyed, and they are now by law reserved from settlement, being sold by the State in a manner similar to the United States' method, but in claims with vertical side lines below the surface.

2. *Copper.*—More enthusiasm has been elicited by the copper prospects than by any other mineral resource of Texas. In earlier days a very large amount of excavation was performed in Llano County without satisfactory pecuniary returns. Much of this work was of a skimming or 'gouging" character, and not a little money was foolishly expended in places where no indications of ore were visible. But there are some veins which carry sulphuretted (*bornite*) and carbonated (*azurite* and *malachite*) ores in such quantity as to warrant more expenditure for development than has yet been applied. Novice work, such as much of the digging was in that district, leaves the projects at the very time when the question of their worth is about to be established, *pro* or *con*. It is extremely difficult, under the circumstances, to form a safe judgment regarding the intrinsic value of many of the properties, which are now flooded or in last stages of decay. But there seem to be some veins which might be made to pay if properly opened by skilled engineers backed by sufficient capital to explore and develop them systematically. For the most part, the ores at surface and for considerable depths are oxidized, but their distribution and the structure of the "country" are such as to suggest accumulations of considerable importance at greater depths. The possibility of securing rich silver ores in conjunction with them should afford additional inducement to the prospector for copper.

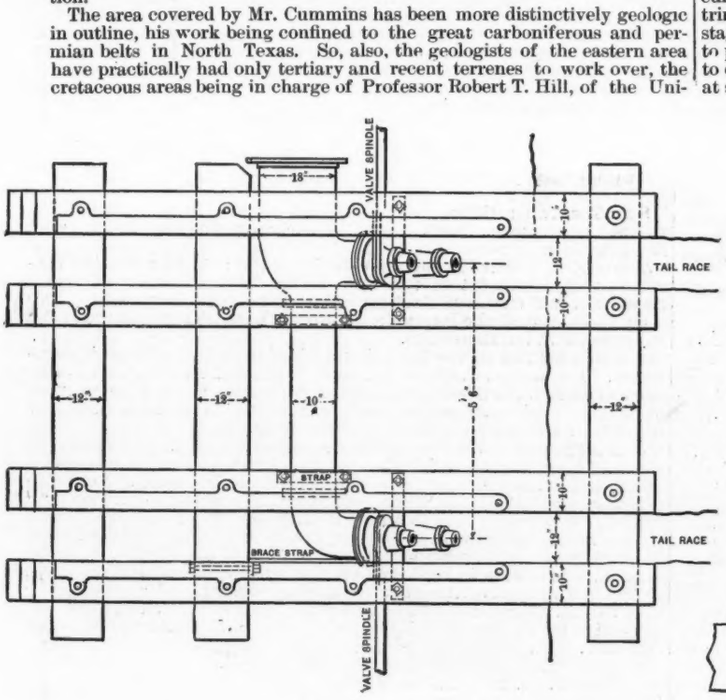


FIG. 2.

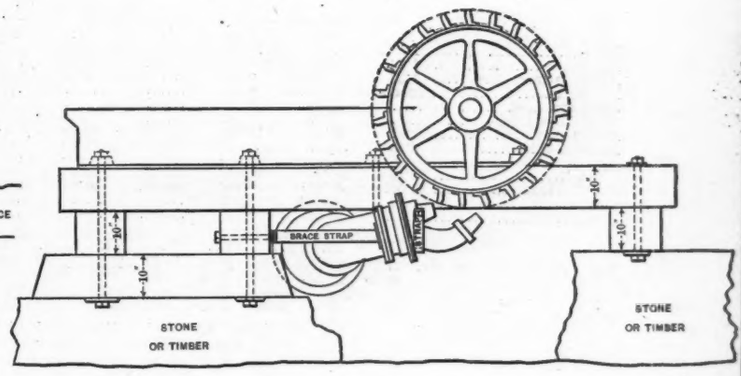


FIG. 3.

PELTON WHEEL ARRANGEMENT FOR AIR COMPRESSOR.

The southwestern region appears to have a similar development of the base metals, but more work has been done there and shipments are constant and regular. The chief drawback there is the uncertainty of titles due to the bugbear of old Mexican grants, but satisfactory arrangements can usually be made for acquiring mineral rights. Some speedy adjustment may be expected of those cases in which the State refuses to recognize the grants.

3. *Lead.*—About the same statement as that made under the head of copper may be applied with equal force to the lead ores of Texas, except that it would not cover the whole ground. There are indications, amounting to much more than suppositions, that the geographical distribution and actual occurrence of galena are much more extensive than is now known. In the West the shipments are already of importance, and in the central region new discoveries are frequent. Unfortunately, these latter do not usually show the ore in masses of any considerable size, but they occur in situations which make it very probable that more important deposits are not far to seek. Aside from iron ores, galena is the most prevalent ore in the central mineral region, but it is nowhere mined at present, and no extensive bodies have yet been discovered. It is a fact not generally known that the search for this mineral has not been conducted in the places where the chances are best for finding it. Rocks equivalent in horizon to those of the galena-bearing beds of Illinois and Missouri are abundant in central Texas, and there is at least much hope that eventually these may yield a reliable supply of the ore.

4. *Iron.*—It is as the seat of a commanding iron industry that central Texas must look forward to her future glory, in the main. With all the wonderful array of natural resource and artificial forcing which has brought to light the great possibilities of the South in other districts, I do not hesitate to report from actual knowledge that Texas may con-

† Professor Hill has since resigned from the University and has become the head of the division of cretaceous geology upon this survey.

‡ See "Notes on Some of the Minerals of Texas." By E. T. Dumble. *Age of Steel* St. Louis, January 4th, 1890, Vol. LXVII., p. 20.

fidently expect to take very high rank among them all whenever her dormant iron fields become fully known. In amount and quality, and in facility of mining, reducing, manufacturing and distributing of products, no other State can equal this when the ordinary forces of civilization have been properly applied to utilize what Nature has provided. Very extensive deposits of *beauxite, limnite, limonite* and other hydrated ores, in many instances not seriously contaminated with silica, occur all through the area of central Texas; *hematites* and *magnetites*, though more restricted, exist in great quantity over wide belts; and many of these show by analyses that they are rich in metallic iron and free from undesirable contamination. The distribution of the hydrated ores is practically unrestricted. Workable deposits exist in connection with the widest variety of rocks from the oldest to the most recent, but the accumulations are chiefly vein deposits or segregations instead of bog formations. Hematite occurs in various forms, both as beds and as inclosures in quartz and other matrices. The magnetites form well-marked belts extending across the whole area along certain lines of greatest disturbance.

Without attempting a minute classification and excluding some notable exceptions, it may be stated in a general way that the magnetic ores follow mainly the trends of the oldest gneisses and schists; that the hematites, excepting those of secondary origin, are largely characteristic of the lower Potsdam and earlier horizons, and that the hydrated ores are, in largest measure, direct or indirect alterations of the anhydrous deposits previously defined. As to geographic distribution, although strict accuracy must be disclaimed at present, it is roughly correct to designate the northwest trend and the region in Llano county (with extensions into Blanco and San Saba counties) as preëminently the *magnetite* belt; the *hematite* belt, par excellence, covers a wide area bearing more nearly north and south, extending through a very large share of Llano and Mason counties (continuing into Gillespie county). The more recent cross-trends carry in their strikes, as a rule, only the secondary deposits of magnetite and hematite *crystals* and the limonites.*

About 500 miles of section lines have been run out instrumentally under the writer's direction in these ore fields (with the solar transit), and the distribution of the ores has been thoroughly studied. The maps accompanying the report will give a clear exposition of these important resources.

The following analyses may serve as examples of the ores, but they are not selected as types, being merely taken at random from a number tested by Chemist J. H. Herndon and his assistant, Mr. L. Magneuat.

All totals and calculations of metallic iron, sulphur and phosphorus are computed by the writer from the analyses as reported.

	HEMATITES.*			MAGNETITES.*		
	I.	II.	III.	I.	II.	III.
Silica	1·90	8·90	10·80	5·10	4 70	4·65
Lime	1·73	2·14	4·45	0·01	1·40	Trace
Alumina (and loss)	1·33	4·25	3·04	.....	4·44	0·76
Magnesia	Trace	Trace	0·04	.....	.....	.....
Sulphuric acid	.....	0·42	0·335	.....	.....	0·75
Phosphoric acid	.....	0·90	0·357	.....	Trace	Trace
Ferric oxide	91·41	84·15	79·56	68·64	65·70	77·10
Ferrous oxide	3·42	.....	.....	26·49	23·26	16·54
Total	99·79	100·76	98·582	100·24	94. 50	99·80
Metallic iron	66.644	58·905	55·692	68.681	61·063	66·821
Sulphur	.....	0·168	0·134	.....	.....	.....
Phosphorus	.....	0·393	0·156	.....	.....	.....

	LIMONITES.†							
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Water, organic matter, etc.	14·27	13·70	13·90	12 68	14·69	14·10	10·57	13·45
Silica	10·79	13·36	0·93	6·04	9·64	8·70	27·33	16·20
Lime	Trace	Trace	Trace	1·50	Trace	Trace	Trace	Trace
Alumina	8·20	3·40	19·96	0·69	8·16	13·18	1·10	11·20
Magnesia	....	Trace	....	.	....	....	....	....
Sulphuric acid	....	....	Trace	Trace	....	Trace	Trace	....
Phosphoric acid	....	0·157	Trace	Trace	Trace	Trace	Trace	Trace
Ferric oxide	66·10	68·80	65·79	79 06	67·84	64·32	61·20	59·20
Total	99·36	99·417	100·58	99·97	100·33	100·30	100·20	100·06
Metallic iron	46·27	48·16	46·05	55 34	47·49	47·02	42·84	41·44

* All the magnetites and hematites are from Central Texas. None are found in East Texas.

† Including various forms of hydrated ores. All here are given from East Texas, where the largest deposits occur (in the territory). Such ores in the Central region are not always in valuable quantities, but they usually show higher percentage of ferric oxide than are here quoted.

A good deposit of hydrated ore in the central region carries 81.12 per cent. of ferric oxide (56.784 per cent. of metallic iron) and others are of similar quality. These contain other ingredients in about the same proportion as in the above list of limonites, but as the Palozoic area affords a greater range of conditions for segregation, general classifications are not of much value.

Although not very much has yet been done toward the commercial utilization of the central ores, the people of that district have not been idle.

A railroad route from Comfort station, on the Fredcricksburg branch of the San Antonio and Aransas Pass Railroad, has been nearly graded thirty-five miles northward to Llano, and active preparations are being made for the erection of furnaces eight miles farther west upon the north bank of the Llano River. The energy displayed by the enterprisng citizens of Llano, who have practically furnished all the money for the railroad, will certainly not be in vain, for there is no question of the eventual growth of the iron industry to enormous proportions in that region.

Eastern Texas, with its immense deposits of limonitic ore capping the tertiary hills, has already attracted much attention from capitalists, and the successful practical tests at New Birmingham, in Cherokee County, are rapidly building up that section of the State. In calculations for the future Texas cannot, as heretofore, be left out of the account.

The commercial problems connected with the economical reduction of the ores are comparatively simple, but it is often just such little matters that are least comprehended by the class of investors who become the pioneers in metallurgic development. Railroad building must precede the smelting of the central ores, because the fuel supply (excepting a limited supply of timber) is not just at hand; but the coal fields of northern Texas are within easy reach and means of transport will soon be provided for the ores. In East Texas, an abundant present supply of timber is coupled with extensive deposits of Tertiary lignites, which Mr. Dumble believes will hereafter be largely used in iron metallurgy. I shall hope soon to give you another letter bearing upon the fuels and other economic materials of the State, which are no less abundant and important than the metallic resources.

5. *Manganese.*—In the mountainous portions of the central district manganese ores have been discovered and superficially worked. Some of these have a wider distribution than has generally been believed. The explorations made thus far do not show a clear conception of their mode of occurrence, which has, however, been worked out in the field by the writer, with tracings of the outcrops.

6. *Zinc, Tin, etc.*—Zinc is not a common metal in the minerals collected by the survey, but the chances of its existence in areas, not yet carefully studied, are such as to make this evidence not very positive. Tin is also to be classed among the uncertain metals. Some indications of its presence are as yet too fragmentary to be used as more than hints in the search.

7. *Rare Metals.—Gadolinite*, associated with a small variety of cerium, yttrium, erbium and thorium minerals, is a product of a limited tract in Llano County, on the Colorado River; and other occurrences of the rarer metals have been investigated the past season. Messrs. Genth, Mackintosh and Hidden have described several new minerals from the *gadolinite* locality known as the Barringer tract.

In conclusion, it is agreeable to add that the people of Texas seem very willing to have their resources fully discussed, and the truth fairly stated without resort to clap-trap methods of advertising. The simple, truthful exposition of the State's resources in the Museum of the Geological Survey at Austin has satisfied them that they have nothing to fear from competition with other States when their own territory has become legitimately cultivated and developed.

Austin, Texas, March 17, 1890.

* The term *limonite* is used here in its loose but popular sense, to designate the various species of hydrous iron oxides as a whole.

THE RAIYAN ESCAPE AND STORAGE RESERVOIR.

Written for the Engineering and Mining Journal by Cope Whitehouse, F. G. R. S.

Sir: The two articles which appeared in your issue of March 1st escaped my attention until to-day. There are points on which I should like to offer some remarks.

The subject is divisible into three distinct parts: 1. The physical conditions of Middle Egypt to the west of the Nile, accurately surveyed, reveal new and very important geological and geographical facts.

On these grounds the International Jury of Geographers awarded me a silver medal at the Exposition.

2. The history of Middle Egypt is contained in native and foreign documents. The ancient traditions in regard to Pharoah Raiyan, the Hebrew story of Joseph, the Greek accounts of King Moeris, and the cartography of Middle Egypt have been collected and shown to possess a historical importance either not conceded or explicitly denied.

3. The regimen of the Nile has been a subject of careful consideration by the most eminent engineers of the century. From Bonaparte onwards the alternate flood and drought have engaged anxious attention. Very considerable sums of money have been expended, without corresponding results. It would be easy to recall a large number of engineers, whose names are associated with such enterprises as the bridging of the Forth, the Manchester and Suez canals, the regulation of the Danube and the Ganges, who have been invited and paid to consider the problem presented by the Nile without arriving at a satisfactory solution.

In 1887 M. Barios, *Ingenieur-en-Chef des Ponts et Chaussées*, published a treatise on Irrigation in Egypt, which has been translated by Major Miller, U. S. A., and issued as a Congressional document. He divides the new works in Egypt into three classes: *a.* Improvement of existing canals. *b.* Substitution of perennial irrigation by canals for the "basin system," *i. e.*, where a large area of perhaps 10,000 acres, inclosed by banks, is flooded to the depth of say 10 feet, and the impounded waters fertilize and refresh the soil for one annual crop. *c.* The regulation of the discharge of the Nile so as to decrease the too high floods and increase the extreme low water.

"As to the third point of the programme," he says, "that is to say, the regulation of the Nile, with the object of diminishing the discharge of the flood and increasing the discharge of low water, *its realization is still distant.*" He describes the projected dam at Silsileh from the report of M. Jacquet, made to a French company, July 15, 1882, as the only project available even for consideration.

While the Government Printing Office in Washington, in 1889, was engaged on Major Miller's translation, Colonel Ross, C. M. G., Inspector-General of Irrigation, was publishing in London that "the storage of water in the Wadi Raiyan *will remove many difficulties about summer supply;*" while Willcocks declares that the canal of supply would be an escape, "which *will be of use in reducing* appreciably *the water level of the Nile* during a very high flood; a breach of the Nile banks in flood is the greatest calamity which can overtake the country, and any scheme which promises relief to the country in flood deserves careful consideration."

The Raiyan project is, according to Willcocks, in "a complete and perfect state." The differences in estimates of cost and profit, and even the selection of the line of the proposed canal, have not the same importance in this project that they would have elsewhere. The existence of a depression near the Nile, accessible *for the discharge of flood water* by a 100-meter canal at a maximum of $5,000,000 is admitted. The capitalization of the value of such an escape may be $10,000,000 or $25,000,000.

This overflow can be stored. There are 3.000,000 acres to be reclaimed. Whether the reservoir discharges 12,500,000 cubic meters per diem and redeems 400,000 acres; or is utilized to a duty of 50,000,000 c. m. and redeems 3,000,000 acres, with a navigable mouth of the Nile always open from Cairo to the Mediterranean, is again of minor importance. The additional cost of the canal across the Nile Valley, and $10 per acre for land to be worth $100, may cost another $5,000,000. The capitalized value of 400,000 acres, *in net taxes*, would, according to Willcocks, pay 15 per cent. The estimates, therefore, do not vary destructively. Willcocks includes in the Raiyan project a canal across the Nile Valley. I distinguish between the escape, which is from 7 to 12 miles long, commencing at the desert, and the feeder which takes off from the deep channel of the river. Will-

cocks excludes every benefit obtained, except "net taxes" on "*new* land," and gives the *minimum* discharge, using the up-stream feeder as a discharge, and then earns "at least 15 per cent."; while Ross says, *rightly*, that Egypt can borrow as much money as is required at five per cent. The current rate for government paper is very little above four per cent. Secured bonds would readily sell at this rate.

The Silsileh project was examined in December, 1889, and rejected. Sir C. C. Scott-Moncrieff, writes to me that the Raiyan project is without a rival; but adds that no further steps will be *taken* or *permitted* for about three years. There is no difficulty about the money. The land-laws of Egypt which define the right to acquire desert or prosecute such a work as this have been suspended by the British Government. The Nile is in reality a very well-behaved river, the most tractable stream of any importance in the world. But the Raiyan project is something so "vast" to Baring and Moncrieff that they will not undertake it themselves, nor let me or any one else undertake it. Any one of a dozen Arab engineers would commence to dig to-morrow and finish it in first-class style for less than $2,500,000. It might save Egypt $10,000,000 the next year. The United States has no national weight which Lord Salisbury would regard as entitling me to be treated with the consideration that would be shown to a citizen of the powerful Republic of San Marino, or a subject of the Prince of Monaco. There is no appeal to moral sense, international law or the statutes of Egypt from this "non possumus."

I gratefully acknowledge the assistance you have afforded in my efforts to develop the advantages and diminish the imaginary difficulties. In time it may be reduced to such a shape that Sir E. Baring and Sir C. C. Scott-Moncrieff will think it not beyond their ability to tackle. Or, alas! wait. Time will sooner or later bring such a flood or water famine as will justify Europe in requiring Lord Salisbury to safeguard the large interests represented by the Commissioners of the Public Debt, and withdraw from active intervention in Egyptian affairs those who desire to still further diminish the area and resources of the region bordering on the highway to India.

THE TARIFF BILL.

The following is the text of the clauses in the bill prepared by the Ways and Means Committee affecting "miscellaneous metals and manufactures of" under Schedule C:

Aluminum or aluminum manufactured or in crude form or contained in alloys in which aluminum is the component material of chief value, 35 per centum ad valorem.

Antimony, as regulus or metal, three-fourths of one cent per pound.

Argentine, albata, or German silver unmanufactured, 25 per centum ad valorem.

Brass, in bars or pigs, old brass, clippings from brass or Dutch metal, and old sheathing, or yellow metal, fit only for remanufacture, 1½ cents per pound.

Bronze powder, 15 cents per pound; bronze or Dutch metal, or aluminum, in leaf, 10 cents per package of 100 leaves.

COPPER.

Copper imported in the form of ores, 1½ cents per pound on each pound of fine copper contained therein.

Old copper, fit only for remanufacture, clippings from new copper, and all composition metal of which copper is a component material of chief value, not specially enumerated or provided for in this act, 1¾ cents per pound.

Regulus of copper and black or coarse copper, and copper cement, 1¾ cents per pound on each pound of fine copper contained therein.

Copper in plates, bars, ingots, Chili or other pigs, and in other forms, not manufactured, not specially enumerated or provided for in this act, 2 cents per pound.

Copper in rolled plates, called braziers' copper, sheets, rods, pipes, and copper bottoms, also sheathing or yellow metal of which copper is not the component material of chief value, and not composed wholly or in part of iron ungalvanized, 35 per centum ad valorem.

GOLD AND SILVER.

Bouillons, or cannetille, metal thread, file or gespinst, and epaulets, galloons, laces, knots, stars, tassels and wings of gold, silver or other metals, 35 per centum ad valorem.

Gold leaf, $2 per package of 500 leaves.

Silver leaf, 75 cents per package of 500 leaves.

LEAD.

Lead ore and lead dross, 1½ cents per pound; *provided*, that silver ore containing lead shall pay a duty of 1½ cents per pound on the lead contained therein, according to sample and assay at the port of entry.

Lead in pigs and bars, glaziers' lead, lead wire, molten and old refuse lead run into blocks and bars, and old scrap-lead fit only to be remanufactured, 2 cents per pound.

Lead in sheets, pipes, or shot, 2½ cents per pound.

Metallic mineral substances in a crude state and metals unwrought, not specially provided for in this act, 20 per centum at valorem; mica, 35 per centum ad valorem.

NICKEL.

Nickel in ore, 2 cents per pound for the nickel contained therein.

Nickel in matte, or other crude form not ready for consumption in the arts, 5 cents per pound on the nickel contained therein.

Nickel, nickel oxide, alloy of any kind in which nickel is the component material of chief value, 15 cents per pound.

Quicksilver, 6 cents per pound; flasks, bottles or other vessels in which quicksilver is imported shall be subject to the same rate of duty as they would be subjected to if imported empty.

Type-metal, 1½ cents per pound for the lead contained therein; new types, 25 per centum and valorem.

ZINC OR SPELTER.

Zinc in blocks or pigs, 1¾ cents per pound.

Zinc in sheets, 2½ cents per pound.

Zinc, old and worn out, fit only to be remanufactured, 1¼ cents a pound.

Manufactures, articles, or wares, not specially provided for in this act, composed wholly or in part of iron, steel, lead, nickel, pewter, copper, tin, zinc, gold, silver, platinum, or any other metal, and whether partly or wholly manufactured, 45 per centum ad valorem.

The most important changes under this head are therefore:

Aluminum, hitherto free; proposed rate, 35 per cent. ad valorem.

Antimony as regulus—Present rate, 10 per cent. ad valorem; proposed rate, ¼ cent per pound.

Copper ore, etc.—Present rate, 2½ cents per pound; proposed rate, 1½ cents per pound.

Regulus of copper—Present rate, 3½ cents per pound; proposed rate, 1¾ cents per pound copper contained therein.

Copper in rolled plates—Present rate, 35 per cent. ad valorem; proposed rate, 2 cents per pound.

Lead in sheets, etc.—Present rate, 3 cents per pound; proposed rate, 2½ cents per pound.

Metallic mineral substances—Present rate, 20 per cent. ad valorem; proposed rate, 25 per cent. ad valorem. Mica, 35 per cent. ad valorem; at present free.

Nickel ore, etc.—Present rate, 15 cents per pound; proposed rate, 2 cents per pound for nickel contained.

Nickel in matte, etc.—Present rate, 15 cents per pound; proposed rate, 5 cents pound for nickel contained.

Quicksilver—Present rate, 10 per cent ad valorem; proposed rate, 6 cents per pound.

Zinc or spelter—Present rate, 1½ cents per pound; proposed rate, 1½ cents per pound.

Zinc in sheets—Present rate, 2½ cents per pound; proposed rate, 2½ cents per pound.

Zinc, old and worn—Present rate, 1½ cents per pound; proposed rate, 1¼ cents per pound.

The other alterations of interest to our readers are those of the different classes of acids, etc., as follows:

Acids—Present rate, 2 cents per pound; proposed rate, 1½ cents per pound.

Acids—Present rate, 10 cents per pound; proposed rate, 4 cents per pound.

Acids—Present rate, 4 cents and 5 cents per pound; proposed rate, 5 cents per pound.

Acids—Present rate, 15 per cent ad valorem; proposed rate, 6 cents per pound.

Blue vitriol, etc.—Present rate, 3 cents per pound; proposed rate, 2 cents per pound.

Zinc oxide, etc.—Present rate, 1½ cents and 1¾ cents per pound; proposed rate, 1¾ cents per pound.

Sulphate soda—Present rate, 20 per cent. ad valorem; proposed rate, $\frac{1}{10}$ cent per pound.

Sulphur—Present rate, $10 per ton and $20 per ton; proposed rate, $8 per ton and $10 per ton.

Sulphur, refined—Present rate, $\frac{3}{10}$ cent per pound; proposed rate, ¼ cent per pound.

Fire-brick—Present rate, 20 per cent. ad valorem; proposed rate, $1.25 per ton.

Cement, Roman, Portland and hydraulic, present rate, 20 per cent; proposed rate, 8 cents per 100 pounds.

Lime.—Present rate, 10 per cent., proposed rate, 6 cents per 100 pounds.

Plaster of Paris, ground.—Present rate, 20 per cent., $1 per ton; calcined, proposed rate, 20 per cent., $1.75.

Beams, girders, joists, etc.—Present rate, 1¼ cents per pound; proposed rate, ¼ cent per pound.

Boiler or other plate iron or steel, etc.—Present rate 1¼ cents per pound; proposed rate, 1, $1\frac{5}{10}$, $1\frac{6}{10}$, 3½, 2, $2\frac{5}{10}$ cents per pound, 45 per cent. ad valorem.

Forgings of iron or steel, etc.—Present rate, 2½ cents per pound; proposed rate, $2\frac{5}{10}$ cents per pound, 45 per cent. ad valorem.

Hoop or band or rolled, etc.—Present rate, 1 $1\frac{5}{10}$, $1\frac{4}{10}$ cents per pound, 35 per cent. cotton ties; proposed rate, $1\frac{1}{10}$, $1\frac{8}{10}$ cents per pound.

Steel railway bars, etc.—Present rate, $17, $17.10 per ton, $\frac{9}{10}$, $\frac{10}{10}$ cents per pound; proposed rate, $\frac{6}{10}$ cent per pound.

Sheet iron or steel, common, black, etc.—Present rate, $1\frac{1}{10}$, $1\frac{3}{10}$, $1\frac{4}{10}$ cents per pound, 30 per cent. ad valorem; proposed rate, $1\frac{1}{10}$ cents, $1\frac{4}{10}$ cents per pound.

Sheets of iron steel, etc.—Present rate, $1\frac{4}{10}$ cents, $1\frac{85}{100}$ cents, 95-100 cents, $2\frac{85}{100}$ cent per pound; proposed rate, ¼ cent per pound, more than common. Note.—And on and after July 1st, 1891, tin plates terne plate and taggger's tin shall pay ¼ cent per pound more duty than the rates before imposed under corresponding gauges.

Sheets, polished, etc.—Present rate, $1\frac{85}{100}$ cents, $1\frac{75}{100}$ cent. per pound, 30 per cent. ad valorem; proposed rate, 2½ cents per pound.

Cast-iron pipes—Present rate, 1 cent per pound; proposed rate, $9\frac{1}{10}$ cent per pound.

Castings of malleable iron, etc.—Present rate 2 cents per pound; proposed rate, 1¾ cents per pound.

Anvils—Present rate, 2 cents per pound; proposed rate, 2½ cents per pound.

Wire rods—Present rate, $6\frac{1}{10}$ cents per pound, 45 per cent. ad valorem; proposed rate, $6\frac{1}{10}$ cents per pound.

Steel ingots, etc.—Present rate, 2 cents, 2¾ cents, and 3½ cents per pound, 45 per cent. ad valorem; proposed rate, $\frac{5}{10}$ cent, $\frac{6}{10}$ cent; $\frac{7}{10}$ cent, $1\frac{1}{10}$ cents, $1\frac{6}{10}$ cents, 2 cents, $2\frac{1}{8}$ cents, $3\frac{1}{4}$ cents, and 4 cents per pound; 45 per cent. ad valorem.

Electrolysis by the Igneous Fusion of Aluminum Oxide and Fluoride.—Adolphe Minet.—The author seeks to utilize this kind of electrolysis as the point of departure of a series of applications of electricity to chemistry with especial reference to the production of metallic aluminum. His best results have been obtained with an iron cathode, the intensity of the current being 975 amperes and the difference of potential at the electrodes 6·1 volts. Under these circumstances, the weight of aluminum deposited was 1,900 grammes, as against a calculated quantity of 2,320 grammes, or a yield of 82 per cent.—*Comptes Rendus.*

Siliceous Sinter Formation.—Mr. W. H. Weed, in a recent paper on the formation of siliceous sinter, gives the results of an extensive study of the sinter deposits of the hot springs and pools of the Yellowstone National Park. Mr. Weed, while stating that the conditions governing the stability of a solution of silica are still imperfectly known, especially for such complex solutions as those of the Yellowstone hot springs, groups the causes producing a separation of silica from these natural waters under five heads, namely: (1) relief of pressure; (2) cooling; (3) chemical reaction; (4) evaporation, and (5) plant life. In the Yellowstone Park the deposits formed by the last named agency predominate, and are built up much more rapidly than by either of the other means. Mosses cause the deposition of carbonate of lime and silica, but the greater part of the siliceous growth is due to different species of algæ, which thrive in water of various temperatures fully up to the boiling point for that altitude. The first four causes mentioned tend to produce a supersaturated solution of silica, and thus to cause its separation, but in the Yellowstone they act very slowly, forming films only one-twentieth or even a one-hundred-and-fortieth of an inch thick per year, and sometimes still less, as shown by incrustations over names and dates carved in the sinter deposits in previous years. Organic matter is known to have an effect upon mineral deposition, but, of course, it cannot act at great distances from the surface, and its action is generally a purely chemical one as distinguished from the vital one of the algæ in question. The commingling of acid vapors with the alkaline waters carrying silica has been suggested as one of the forms of possible chemical action tending to the separation of dissolved silica, and a similar effect has been ascribed to the carbonic acid of the air, but is disproved by the fact that free carbonic acid-bubules issue from the thermal waters themselves. The water from the Opal spring is described as yielding no deposit after having been kept in the laboratory for long periods, although holding sufficient silica in the suspension or "pseudo-solution" to retain its singular opalescent appearance. All investigations of this character are interesting on account of the light which may thereby be thrown upon the origin of mineral veins with siliceous gangue.

The Thomson Electric Welding Process has been investigated by a board of naval officers appointed by the Secretary of the Navy on January 9th. The board finds that the process renders it possible, practically, to weld wrought iron, cast iron, brass and copper rods, from the size of the smallest electrical conductors in use for distributing purposes to rods 2½ inches diameter; and to weld pipes of larger sizes; to weld dissimilar metals and pieces of different forms of cross section; to join, by welding, the ends of wire cables, and to form welded rings of small or large diameter. The board reports:

"The following may be mentioned as a few of the many applications that would result on shipboard: For welding broken pump piston-rods, valve stems, etc.; for joining wires of iron, copper or other metals or bars of the same, of similar or different shapes or sections; for making joints at angle with bars (T or Y joints); for mending chain and wire rope; for constructing or joining, end to end, pipes of all kinds, and of large or small diameter; working or joining lead pipe; welding T-connections or elbows into lines of piping; welding safe ends to boiler tubes; repairing boiler tubes; welding eye-rings, and welding these again to bolts or bars; repairing, cutting and boring tools without hurting their temper; lengthening or shortening rods or bars; repairing broken cast-iron pieces of machinery or broken cast-iron or cast-brass fittings; welding copper electric mains. This system of welding thus renders easy many operations in the working of metals, which with the forge and smith have heretofore been considered impossible."

Manufacture of Sulphuric Acid in France.—The Société des Manufactures des Glaces et Produits Chimiques de St. Gobain, Chauny et Cirey, with six different branches, is the largest establishment of its kind in France. They have a lead-chamber space of 156,500 cubic meters with 53 Gay-Lussac towers and 30 Glover towers, in which 117,000 tons of sulphuric acid (reckoned at 66 degrees *B.*) are yearly manufactured. They produce daily 4 to 4·5 kilos of actual sulphuric acid (H_2SO_4) per cubic meter of lead-chamber space, with a consumption of one part of sodium nitrate per 100 parts of H_2SO_4. For the concentration of the acid, they have 26 platinum stills, valued at over 1,000,000 francs. Of nitric acid they manufactured in 1888, 4,100 tons. They decompose annually, 37,000 tons of salt, partly in Mactear ovens, and leave only 0·025 per cent. of iron in the sulphate. The sulphate is partly used as such and partly charged into soda crystals, soda salt and caustic soda. Potassium sulphate, ferrous sulphate and superphosphates, are also manufactured on a large scale. The establishment has just introduced Chance's sulphur regenerative process with perfect satisfaction, which, however, was attended with some difficulties at first, as the character of the soda residues in France differs somewhat from that of the English residues.

The Coal Output of Prussia.—The *Reichsanzeiger* publishes the following review of the coal and lignite output in the Prussian monarchy in 1889: Coal output in the chief mining district of Breslau, 19,008,576 tons; number of hands, 59,019 (1888 output, 17,642,284 tons, 56,338 hands). Chief mining office of Halle, 25,407 tons, 135 hands (25,298 tons and 136 hands). Chief mining district of Clausthal, 573,162 tons, 3,274 hands (497,293 tons, 3,275 hands). Chief mining district of Dortmund, 33,851,190 tons; number of hands 115,357 (33,201,176 tons), 105,303 hands. Chief mining district of Bonn 7,982,516 tons, 34,126 hands (8,095,866 tons, 32,596 hands). Total coal output in Prussia 61,440,851 tons, with 211,911 hands. The corresponding figures for 1888, as finally established, were 59,475,351 tons and 198,222 hands. The total lignite output was 14,216,292 tons, with 24,392 hands (13,207,888 tons, 23,408 hands). Of that quantity no less than 12,877,055 tons was produced in the chief mining district of Halle by 20,927 hands (12,103,368 tons, 20,025 hands). The output of the other chief mining districts was as follows: Breslau 485,539 tons, Clausthal 226,753 tons, and Bonn 606,949 tons.

Decline in Business Abroad.—Numerous complaints reach us from abroad of a falling off in business since the beginning of the year. *Industries* says that the wave of good trade, which arose in the autumn of 1887 and which increased in volume all through 1888 and 1889, seems to have reached its culminating point about the close of the past year, for since 1890 began there have been in many of the leading districts evidences of decline. In some instances freights have fallen to about 50 per cent. of their amount a year ago, and this is leading to a decrease of orders for new ships. Labor troubles are considered to be a prominent cause of the bad features in the industrial situation. The same paper says: "Waste of time, waste of resources, carried to such an enormous extent as was the case in the London docker's strike, cannot but find economic retribution. Never before in the history of industry had the laborer as much actual power as he has now, and he is roundly charged with using that power in a shortsighted and intensely selfish manner. With a fall in prices probably imminent, there is strong reason to believe that strikes will become more and more frequent."

Glazing a Blast Furnace Lining.—An experiment was tried at the Crown Point Iron Company's plant, Lake Champlain, N. Y., some time ago, on the occasion of their relining and starting in blast one of its large furnaces. After the fire-bricks were in place, a cheap article of graphite or plumbago, supplied by the Joseph Dixon Crucible Company, of Jersey City, N. J., was bought, reduced to a paste with water, and the interior of the furnace washed with the plumbago paste. It gave a slippery glaze to the fire-brick lining which refused to be coated with slag, and the charge passed down in less time and left the lining free and clear. The Crown Point managers claim quite a success for their scheme.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

Losses in Gold Amalgamation with Notes on the Concentration of Gold and Silver Ores. By Walter McDonald and P. N. Duffield. Published by E. & F. S. Spon, New York and London. Illustrated. Pages 98. Price, $1.75.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office.

TUESDAY, APRIL 1ST, 1890.

424,446. Steam Engine. George H. Adam, New Albany, Ind., Assignor of one-half to John H. Stotsenburg, same place.
424,456. Hydraulic Cylinder Lubricator. James H. Brookmire, St. Louis, Mo.
424,473. Car-Coupling. Jacob Haish, De Kalb, Ill.
424,474. Brick Kiln. Henry S. Hallwood, Columbus, O.
424,480. Regenerator Furnace. James A. Herrick, New York, N. Y.
424,505. Engine. John M. Sailer, Milton Junction, Assignor to the Flexible Engine and Treshing Machine Company, Rock County, Wis.
424,509. Car-Coupling. Henry Small, San Antonio, Tex.
424,514. Steam Generator. Nathan P. Towne, Washington, D. C.
424,515. Ore Pulverizer. Thomas H. Tregoning, Cambrone, County of Cornwall, England, Assignor to John Tregoning and Charles D. Tregoning, both of Lynn, Mass.
424,520. Cable Lifting Device. Jacob Volk, St. Louis, Mo., Assignor to the Volk Cable, Grip and Car Brake Company, Chicago, Ill.
424,528. Steam Engine. Amasa Worthington, Brooklyn, N. Y.
424,535. Electric Motor. Leo Bock, Jr., New York, N. Y., Assignor, by direct and mesne assignments, to himself, and Charles L. Wright, same place.
424,561. Pressure Regulating Apparatus. Nathaniel C. Locke, Salem, Mass.
424,575. Electrical Insulation. Thomas S. Reed, Jersey City, N. J.
424,582. Car Coupling. Heinrich Sommerfeld, Canton, Kans.
424,595. Regulation of Electric Motors. Sigmund Bergmann, New York, N. Y., and George B. Scott, Lakewood, N. J.
424,606. Choking Electric Magnet. Ludwig Gutmann, Fort Wayne, Ind.
424,609. Fluid Pressure Motor. Daniel E. Kempster, Boston, Mass.
424,629. Steam Generator. Nelson H. Tenney, Acton, Mass.
424,631. Friction Clutch. John Walker, Cleveland, Ohio.
424,634. Fire Pot for Furnaces. Charles H. White, Malden, Mass.
424,646. Steam Boiler. John L. Heald, Crockett, Cal., Assignor to the Heald Manufacturing Company, of California.
424,650. Ingot Manipulator. James Hempill and Joseph Fawell, Pittsburg, Pa.
424,655. Car Coupling. Charles H. Olds, Sayre, Pa.
424,658. Car Coupling. William L. Smith, Indianapolis, Ind., Assignor of one-half to William H. H. Ayars, same place.
424,659. Motor. Renaldo Solano, Brooklyn, N. Y., Assignor of three-fourths to John W. Howard and David R. Morse, same place, and Lucius G. Fisher, Chicago, Ill.
424,660. Valve for Motors. Renaldo Solano, Brooklyn, N. Y., Assignor of three-fourths to John W. Howard and David R. Morse, same place, and Lucius G. Fisher, Chicago, Ill.
424,662. Piston Rod Packing. Ferris D. Toucey, Minneapolis, Minn., Assignor of two-thirds, by direct and mesne assignments, to George S. Grimes and Charles Cutler, both of same place.
424,665. Safety device for electric circuits. Charles G. Young, New York, N. Y.
424,703. Electro Magnet. George D. Clarke, Chicago, Ill.
424,734. Electric Motor. Lawrence T. Smith, Providence, R. I.
424,735. Steam Boiler. William H Smith, Chicago, Ill.
424,737. Furnace. William H. Strang, Camden, N. J.
424,751. Electrical Conductor. John A. Barrett, Brooklyn, N. Y.
424,785. Coal Chute. Daniel H. Henkels, Philadelphia, Pa.
424,79-. Railroad Tie. Abraham Kimber, Indianapolis, Ind.
424,810. Electric Locomotive. James F. McLaughlin, Philadelphia, Pa.
424,818. Electric Railway Motor. Frank A. Perret, Brooklyn, N. Y., Assignor to the Elektron Manufacturing Company, of New York.
424,819 424,820. Process of Sinking Shafts in soft earth. Thomas J. Phillips, Cleveland, Ohio
424,828. Method of Burning Fuel and Utilizing the Heat and Gases. Martin V. Smith, Pittsburg, Pa., Assignor to the Pittsburg Metallurgy Company, same place.
424,829. Steam Boiler Furnace. Martin V. Smith, Pittsburg, Pa., Assignor to the Pittsburg Metallurgy Company, same place.

DIVIDENDS PAID BY MINING COMPANIES DURING MARCH AND SINCE JANUARY 1ST, 1890.

NAME OF COMPANY.	Paid in March.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in March.	Paid since Jan. 1st.
Atlantic, Mich	.....	$60,000	Little Chief, Colo	...	$10,000
Aspen, Colo	$20,000	20,000	Little Rule, Colo	$10,000	10,000
Badger Ontario	12,500	37,500	Mammoth, Utah	40,000	80,000
Boston & Mont., Mont	.....	200,000	Matchless, Colo	.....	2,500
Calliope, Col	10,000	30,000	Metropolitan, Mich	.....	250,000
Calumet & Hecla, Mich	.....	500,000	Montana Ltd., Mont	.....	60,666
Central, Mich	.....	20,000	Napa, Cal	.....	20,000
Cons. Cal. & Va., Nev	.....	108,000	Ontario, Utah	75,000	225,000
Cumberland, Mont	.....	15,000	Oro, Colo	25,000	40,000
Daly, Utah	37,500	112,500	Osceola, Mich	50,000	50,000
Don Enrique, Mex	.....	3,000	Parrot, Mont	18,000	54,000
Franklin, Mich	.....	80,000	Puzzler, Col	.....	5,000
Granite Mountain, Mont	200,000	400,000	Quicksilver Pref., Cal	.....	64,370
Homestake, Dak	12,500	37,500	Quincy, Mich	.....	120,000
Horn Silver, Utah	50,000	50,000	Republic, Mich	.....	100,000
Iron Mountain, Mont	.....	25,000	Silver Mg. of L. V., N. M	.....	25,000
Kearsarge, Mich	.....	100,000	Tamarack, Mich	.....	120,000

*Part of this dividend is to be paid in April.

PERSONAL.

Mr. Stewart W. Cramer, mining engineer, of Charlotte, N. C., has been appointed representative of THE ENGINEERING AND MINING JOURNAL, and has opened an office at Charlotte, N. C.

Mr. Cramer will write a series of articles on Mining and Engineering in the South that will be of great interest and value to capitalists who have invested there or propose doing so. These papers will also make the great mineral resources of the South more familiar to our readers and no doubt will bring much capital into that rich district.

The distinguished chemist, Dr. Gideon E. Moore, will remove his laboratory, May 1st, from 69 Liberty street to 221 Pearl street, New York. Dr. Moore has one of the most complete laboratories in this city.

Mr. Tong Sing Kow, who has been educated at College Park, Santa Clara County, California, and who is connected with large mining operations in China, has made an extensive tour in this country in company with a mandarin of high rank. He left for China recently, and expects to return to this country shortly to order machinery, etc.

Dr. Francis Wyatt, of New York, has gone to Florida to inspect and report on phosphate lands for a New York syndicate. He takes with him a complete laboratory equipment and hopes to clear up the phosphate and alumina question quite definitely. He will publish the results of his investigations in the ENGINEERING AND MINING JOURNAL.

OBITUARY.

Frederic Graff, ex-chief engineer of the Water Department of Philadelphia, died suddenly on the 30th ult., aged about seventy-three years.

J. C. Campbell, died suddenly of heart trouble at Streator, Ill., on the 26th ult. He was for a time engaged in coal mining on a small scale in La Salle County, Ill. Then for several years he was occupied in building railroads in this and adjoining States. In 1879 he organized the River Bank Coal Company, of which he was the manager at the time of his death.

Alexander L. Crawford, one of the oldest and most extensive iron and coal operators in the United States, died on the 1st inst. at his home in Newcastle, Pa. A history of his busy life is a history of the iron, coal and ore industry of Pennsylvania, Ohio, Michigan, Indiana, Missouri and Tennessee. He was born seventy-five years ago in Montgomery County, Pa. He was a pioneer in the iron business, and in 1842 built the Etna Iron Works in Newcastle. Since then he has erected there the Etna blast furnaces, the Crawford Iron and Steel Works, the Newcastle works and the Newcastle Wire Nail Works. He built a blast furnace at New Wilmington, Pa; one at Lowell, Ohio; one at Sligo, Dent County, Mo., and two at Terre Haute, Ind. In 1850 he developed and shipped the first ore from the great Lake Superior mines at Marquette, and in 1866 opened the immense block coal region at Brazil, Ind. Mr. Crawford was an organizer of the Newcastle & Beaver Valley road and the Pittsburg & Ashtabula road. Mr. Crawford was also interested in several other railways in this and other States.

SOCIETIES.

The Polytechnic Society has been organized at Salt Lake City, Utah, with the following officers: Colonel C. L. Stevenson, President; General Daggett, Vice-President; M. S. Hanauer, Secretary; W. E. Jacobs, Treasurer; C. F. Annet, M. Mack, M. D. Kerr, Directors. At a meeting held on the 27th ult, Colonel Stevenson represented the civil engineers, General Daggett the mining engineers, Mr. Hanauer the assayers and chemists, M. Jacobs the mechanical engineers, Mr. Annett the electrical engineers, Mr. Mack the civil engineers and Mr. Kern the architects. A Committee on Membership, consisting of E. Haviland, Jr., R. Gorlinski, W. A. Hodges, W. E. Jacobs, R. Kletting, and A. A. Moreton was named and the meeting adjourned. The by-laws state the following as the objects of the society: Its objects are the professional improvements of its members, the encouragement of social intercourse among men of practical service, the advancement of the scientific professions, and the establishment of a central point of reference and union for its members. Among the means to be employed for attaining these ends shall be periodical meetings for the reading of professional papers and the discussion of scientific subjects; the foundation of a library; the collection of maps, drawings and models; and the publication of such parts of the proceedings as may be deemed expedient. All persons who are engaged professionally in the practical application of science shall be eligible for admission, and the society shall consist of members, juniors and associates. The members shall be those who are qualified to design as well as direct work in their professions, and who shall have been engaged in the practical application of science for a period of six years or for a period of four years if a graduate of a college or technical school. To be eligible as an honorary member, a person must be of acknowledged eminence in some branch of the scientific professions. A junior is defined as one who has had actual practice in the scientific work of the profession for a period of two years, or, if a graduate of a scientific or collegiate institute, for not less than one year. An associate shall be one who, by reason of education or occupation, is brought into actual sympathy with scientific subjects. A fund is provided called the fellowship fund, which shall be devoted to a library and to the publication of the papers read before the society. The subscribers to the fund shall be called the "fellows of the society." A fellow shall be a subscriber who has signified to his proposers a desire to be nominated, and an intention, if elected, to become a member of this class.

INDUSTRIAL NOTES.

The works of the Upson Nut Company, in Unionville, Conn., were burned on the 31st ult.

The Carnegie Iron Company at Johnson City, Tenn., has commenced work on its 125-ton iron furnace, and, it is said, will build three additional furnaces at the rate of one per year.

The W. Dewees-Wood Company is about to buy a site for a rolling mill at or near Duquesne, Pa. The firm has a patent on planished Russian iron. The present McKeesport quarters of the company have become too small.

The Keating Implement and Machine Company, of Dallas, Tex., has been appointed the representative of the Abendroth & Root Manufacturing Company, of New York, in that city. It will handle particularly the Root New Water Tube Boiler.

The New York, Pennsylvania & Ohio Railroad recently placed an order for 500 thirty-ton coal cars. This makes a total of 1,000 cars ordered during the past year, 900 of them being thirty-ton cars and 100 twenty-five-ton cars. The company to whom this contract has been let has also an option on 500 more cars.

It is reported that an English syndicate has purchased the principal sewer-pipe works of the Ohio Valley. The works purchased are the Great Western Fire Clay Company, John Francis Sons & Co. and the Ohio Valley Clay Company, of Toronto; Freeman Fire Clay Company, McMahon, Porter & Co., of West Virginia, and a concern at Wellsville, Ohio. The consideration is said to be about $2,000,000.

Mr. S. H. Cochran, of Boston, Mass., is making preparations with the owners of a prominent Boulder County mine, for the placing of one of his "Releasers" upon their property, with a complete plant, for the treatment of their refractory ore, which runs high in gold. Experiments made in Boston, from tellurides, having proven satisfactory, the plant will be at once built. This process has commenced to attract considerable attention, and will be watched with interest.

One thousand five hundred Standard steel ties have been ordered by the Delaware & Hudson Canal Company, and will be laid on the Rensselaer & Saratoga Division just north of Ballston. The Rensselaer & Saratoga Railroad is the oldest roadbed in the United States where mules first furnished the motive power, and the rails used were of oak, with iron straps nailed along the top. Ties will be laid in three sections, one at 2 feet centers, another at 2 feet 6 inches centers, and the third at 3 feet centers, laid with 67-pound rails, to ascertain the most economical method of using these ties. The joints used will be the Standard metal tie joint, which gives a bearing of 31 inches under each joint. It is understood that the Delaware & Hudson Canal Company will adopt and equip its entire system with Standard ties should this section meet the expectations of its officials. The ties will probably be delivered in the course of a week and laid at once.

An International Exhibition will be held in the Island of Jamaica, B. W. I., in January, 1891, under the auspices of the Government of Jamaica. In view of the very considerable and increasing trade between the United States and the West Indies, the committee has appropriated a large space for American exhibits. This is an opportunity which those who are interested in introducing American manufactures and extending the export trade of the United States should not fail to take advantage of. No charge will be made for space in the exhibition buildings, nor will duties be levied on any of the exhibits unless sold in the Island. The geographical position of the Island and the salubrity of the climate will undoubtedly attract a large number of visitors from the neighboring islands and South and Central America, as well as from the United States. In addition to the present accommodations for visitors, a large hotel has been recently erected and opened, near the exhibition grounds, under American management. The railroad system of the island, which has been recently taken over by an American company, is rapidly being extended. The regulations of the committee, and full information as to the mode of shipment, rates of freight and marking of exhibits, and all other particulars as to the scope and object of the exhibition, will be furnished by the secretary, Mr. Thomas Amor, Stewart Building, 280 Broadway, New York.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

728. Water works. All the necessary supplies required for complete water works. Texas.

729. Reliable party to sink an artesian well; must have some experience and give bond. Texas.

730. Small printing press, second hand. Tennessee.

731. Addresses of parties manufacturing an automatic sampling machine for sampling ore, furnace products, etc. Ontario.

732. Steam engine and pump, all complete, to pump water from a well 20 feet deep up into a tank 20 feet high, and capable of keeping a steady stream running through an 1½ inch pipe. Lowest cash price. Mississippi.

733. Saw, 44 inch, complete. Tennessee.

734. Brass cupola with fixtures. Georgia.

735. Good second-hand elevator with the latest improvements. Georgia.

736. Upper dredge of 800 to 1,000 yards daily capacity. Nebraska.

737. Small second-hand electric light plant to run by water power. North Carolina.

741. Steel rails, locomotives, and flat Cars. Georgia.

742. Catalogues and prices of cedar tanks, logging carts, common farm wagons, cane mills, evaporators, cotton gins, and presses. South Carolina.

743. Pump or dredge suitable for excavating and distributing marsh mud and sand for filling purposes. Florida.

744. Contract with some foundry to make two or three tons of light gray iron castings. North Carolina.

745. 500 pairs of plow handles. North Carolina.

746. Lot of flat machinery, steel and iron. North Carolina.

747. Coil brass spring wire. North Carolina.

748. Overhead traveling hoist. Vermont.

749. Electric light plants, ice factories, and water-works supplies for two cities in Texas.

750. Water pumps: ammonia pumps, boilers, cast-iron cylinders, lap-welded, extra heavy; 1¼ ammonia pipe, bent pipe work, asbestos cocks, valves, ammonia gauges, etc. Also vacuum pumps and freezing cans. Georgia.

751. Wood planer to dress crooked plow beams and for surfacing; second-hand, in good condition. Tennessee.

752. Several second-hand upright engines, 3 to 10 H. P.; also good second-hand upright boiler on wheels, 12 to 18 H. P. New Jersey.

753. Shafting, belting and pulleys, Iowa,

754. One 8-inch automatic engine and one 10-inch plain slide-valve engine. Kentucky.

755. Automatic engine, 10 H. P. Tennessee.

756. Wood-working machinery, band sawing machinery, machine for cutting stamp grooves in tobacco boxes, and machine for cutting lining sticks for tobacco boxes. Tennessee.

757. A heavy single saw mill. Alabama.

AMERICAN GOODS WANTED ABROAD.

702. Brick and tile machinery. Mexico.

739. Oil cloth for tables. Name of firm manufacturing same with whom we can enter into commercial connection without the assistance of commission men. We pay in advance; that is, we send our check on New York when we order the goods, and want the full benefit of all discounts allowed the customer. Hayti.

740. Curry combs. Hayti.

738. A plant for a tin mine; all machinery necessary: engines, furnace, crusher, buddles and jigs. Mexico.

758. Two dozen woodman's axes of best make; 4 dozen spare handles. Venezuela.

759. Gas machines for making gas for private residences. Australia.

760. Ten gross No. 2 varnished green-hide floggers. Australia.

761. Hickory handles and keepers, 2 gross, 30-inch; 1 gross, 36-inch; one-half gross, 42 inch. Australia.

762. Sulky plows. Agricultural machinery. Tasmania.

763. Machine, believed to be made in Chicago, for manufacturing soft biscuits. Australia.

764. Machinery of all descriptions for manufacturing chocolate candy, licorice drops, lozenges and marmalade cutting. Australia.

GENERAL MINING NEWS.

J. B. Rae, President of the United Mine Workers of America, has issued a call for a delegate meeting of the miners of Indiana, Illinois, Western Pennsylvania and West Virginia, at Columbus, Ohio, on the 15th inst., to consult with a convention of operators called for that date.

Chief Engineer Robert B. Stanton, who left Denver, Colo., with a corps last November to make a preliminary survey for the Dover, Colorado Cañon & Pacific Railway, from Grand Junction to the Gulf of California, through the Grand Cañon of the Colorado River, recently returned from The Needles. Mr. Stanton and his party are said to be the first men who passed through this dangerous canon since Major Powell made the trip, in 1869. Mr. Stanton is reported to state that the construction of the railway through the canon is feasible, and that from Grand Junction, Colo., to The Needles, a distance of 900 miles, the grade need not at any place exceed 20 feet per mile, and for the greater part of the distance would not be more than from five to ten feet per mile; while the curvature, contrary to general expectation, will be slight.

KANAWHA & OHIO RAILROAD.—It is reported that this railroad, which has its southern terminus at Charleston, W. Va., has been leased by the Chesapeake & Ohio Railroad Company for a long term of years. This gives the Chesapeake & Ohio command of large coalfields, and it also gets the Kanawha & Ohio's trackage agreement with the Columbus, Hocking Valley & Toledo Railroad from Gallipolis to Pomeroy, O., under the reorganization plan of two years ago.

ARIZONA.

COCHISE COUNTY.

CINCINNATI MINING COMPANY.—This company has incorporated in San Francisco to do a general mining and milling business in San Francisco and Tombstone. The directors are: A. F. McGrew, W. B. Reynolds, F. Tagliabue, N. B. Lazard, and W. Gambis. The capital stock is reported to be $10,000,000, all of which has been subscribed.

YAVAPAI COUNTY.

AXTELL MINING COMPANY.—This company proposes to engage in mining operations in this county. It is composed of Iowa and Minnesota capitalists, having been formed by W. W. Vanderbilt during his visit east. They have put up a working capital of $25,000 to commence operations on.

BLACK HORSE MINING COMPANY.—Deeds have been filed for record, transferring title to the Black Horse, the White Horse and two other mining claims from former owners to this company. The price paid is stated to be $15,000.

STANDARD MINING AND REDUCTION COMPANY.—The ten-stamp mill of this company, located eight miles south of Prescott, was destroyed by fire on the 26th ultimo. It is supposed to have been the work of an incendiary. It was erected about two years ago at a cost of $30,000. It has of late been in litigation, and was insured for $5,000.

CALIFORNIA.

LOS ANGELES COUNTY.

(From our Special Correspondent.)

LOS ANGELES, March 24.

There seems to be a very promising revival in mining matters this season throughout Southern California. A large number of prospectors and "chloriders" are now out in the mountains and on the desert at work, and some of them are doing well.

In Los Angeles County there is more interest in the business of mining than for years, if not more than ever before. The richness of the silver ores found last summer in the mines of the San Gabriel cañon has given an impetus to the business, which now bids fair to continue indefinitely.

Near Mouravia, twenty miles east of Los Angeles, prospectors are searching for gold-bearing veins, and at Azusa, a few miles further east, a stamp mill is being built in the Dalton cañon to treat the ores of that vicinity.

On the north side of the San Gabriel mountains at Acton, the Red Rover and New York mines are in constant operation, both turning out golden bars with pleasing regularity.

The Red Rover is the principal mine of the Acton region at present. The vein has been opened to a depth of 500 feet and is now looking well. Many beautiful specimens, showing bright yellow gold, are being taken out. This fissure occurs in a highly metamorphic rock; the quartz is sacaroidal, pure white. The average value of the rock is placed at $12, which is probably not overestimated. A company is now being formed in Los Angeles to develop this property thoroughly and make a mine of it. A new ten-stamp mill is at work on the quartz, crushing about 20 to 25 tons every 24 hours. The stamps weigh, I am told, 760 pounds. The screens used are 30 mesh. Battery and table amalgamation are in use.

The old Topeka mine, once a promising property, and producing, is still idle. About 175 feet of the 1,500 have been explored to a depth of 125 or 150 feet. I consider the chances for good ore bodies still good. Some gentlemen of Los Angeles are negotiating for the purchase of a gold prospect near Acton, but the facts cannot be given at present.

A large and valuable deposit of gypsum at Alpine is being opened and the material manufactured into plaster, fertilizers, etc. This is a new industry and is likely to become what our English friends term "a going concern."

MONO COUNTY.

(From our Special Correspondent.)

BODIE, March 25.

Since last month's report, nothing very interesting has transpired in this section. The roads are still impassable on account of snow. It looks now as if the storm was over, for we have had beautiful weather the last few days. Since the closing of the Standard Consolidated Gold Mining Company's mine on account of the death of Mr. Pettibone, the croakers have more than doubled. It is an astonishing fact that not one miner in twenty lays up anything for a rainy day. I have known young men to work steady from two to five years, Sundays and all, for $4 or $5 per day, and then to take sick, with not a dollar except what happens to be due them since last pay day. Most of the miners here belong to some well-to-do order that takes care of them; still I think it would be a good thing if mining companies could do like the Central Pacific Railroad, keep back $1 out of each month's pay for a fund to take care of disabled employés.

It is not mining alone, but all kinds of business, that have been dull this winter. There is every indication of good times as soon as the roads open, which will be three weeks or a month later than usual. The heavy snow insures plenty of feed for stock and water for irrigating, mining, etc.

Should the much-talked-of overland railway that will be in Pioche Independence Day come this way (which seems likely), it will set new life in all kinds of business in Mono, Inyo, and Tuolumne counties, California. The boom seems to have already started in Eastern Nevada, where this railway is going.

STANDARD CONSOLIDATED GOLD MINING COMPANY.—Mr. Frank Ward, of New York, has been appointed superintendent of this company's mine in Bodie. I have not yet had an opportunity to interview the gentleman. He has been in Bodie about one year, and it is understood that he will carry out the plans of the late Mr. Pettibone. There are still lots of ore in the Standard, but with lower grade and deeper workings; it requires careful management, and all the latest improvements in mining, milling, power, etc. The Standard has been a splendid mine. Since the latter part of 1876, when it was incorporated, it has produced over $11,000,000 and declared over $4,500,000 in dividends. It has but just levied its second assessment. This mine was prospected some years before 1876. An incline following a small vein was sunk 300 feet, but as it did not pay, the mine was pronounced worthless and abandoned. After a while it was relocated by other parties, who leased it to two miners, with the privilege of buying it for $3,000. About 150 feet down and 20 feet south of the incline these miners struck a chimney, from which they took out $6,300, just about enough to pay for the mine and the expense of working. Then they began running in debt, and everything looked blue. Just when they thought the mine was worked out they struck another chute of ore, from which they took out about $50,000, and when they thought it was about giving out they sold it to the present company for $50,000. The two lucky miners, Pete Eshington and Louis Lockberg, went into excesses and died in a very short time, leaving very little of their large fortune.

SAN BERNADINO COUNTY.

In this county matters are even more prosperous. The Garbutt Bros., of Los Angeles, who recently purchased a half interest in the Adams gold mine, near Oro Grande, are building a quartz mill at Victor, on the Mojave River, to treat this rock. The quartz runs about $30 per ton on an average. The property is considered a valuable one.

The Black Hawk people, 45 miles east of Victor, are getting along with their affairs quite satisfactorily. A five year contract to transport supplies and ore was let a few days ago. The management evidently anticipates a continued period of prosperity.

At Silver Reef nothing is being done at present, but a few weeks from this date, I have been informed, work for the season will be commenced. This is a chloride camp, and, like many others, suffers from lack of proper management and scarcity of capital.

Barstow people still talk of a smelter. There is considerable lead rock in that section, and it is possible a smelter might prove a success.

The silver mill formerly owned by the late A. Barber, at Calico, is now under the management of a Mr. Stevens, and is running continuously on custom work, something it has not done before for nearly two years.

A number of chloriders are at work in the Lava Bed district and shipping ore.

Poor, unfortunate Calico, that town has been burned up completely several times, and here and there buildings every little while. The last episode of this sort occurred less than a week ago, when a store and two saloons were burned, with a loss of $10,000. Calico is "tried in the fire," but she always comes up serenely smiling like the fabled phœnix.

SAN DIEGO COUNTY.

People in this county are making an effort to bring some of their mines into public notice. A syndicate of Pomona capitalists have interested themselves in a group of gold properties at Virginia Dale. The owners of claims near Twenty-nine Palms are also at work developing.

Along the Colorado River there are numerous flattering prospects, some of which are being operated quite successfully.

In Exchequer District, Mr. Spawforth is now at work doing the annual assessment work and shipping some high-grade ore.

Out on the Mojave toward Panamint and Resting Springs, prospects are reviving, and shipments may be looked for soon. Many of the miners are preparing for the coming of the new short line of the Union Pacific from Salt Lake to the Southwest.

There is considerable talk of building reduction works at Los Angeles, of which I will have more to say hereafter. "ROVER."

(From our Special Correspondent.)

SAN DIEGO, March 22.

Several large mines in the Julian District have been transferred to capitalists who intend to open them up extensively.

Pine Valley has some good placer diggings which are being worked profitably as well as those at Deer Park. A new stamp mill is being put up.

The formation at Deer Park is porphyry gneiss and slate. The ledges dip easterly; quartz in hard places with free and float gold. The softer varieties of quartz are porous and the major part of the gold is fine and float gold.

Van Wert mine has been reopened and a new shaft sunk 45 feet. The ledge will yield upward of $100 a ton.

The Santa Rosa Ranch has some silver ledges which the proprietor, Mr. Parker Deer, intends to open up soon.

The chief interest at the Burton Ranch seems to be in the cement deposit, from which much is expected, the scarcity of stone in San Diego necessitating the use of cement for many purposes for which stone is ordinarily used. The cement deposit of Jamul and some along the Sweetwater will probably be opened up extensively.

OWENS.—This mine is being steadily worked the ore is rich, and samples run upward of $10 a ton. New machinery and pumps are shortly to be placed in position.

STONEWALL.—Sinking on this mine has been resumed, and as the company has machines to sink 1,000 feet, the district will be greatly benefited and, present indications holding out, a considerable increase in this already valuable mine will result. Its mills are running to their full capacity.

COLORADO.

At Newcastle, on the Grand River, this company is opening up a large coal bed right on the line of the Midland Railroad, of fine quality.

An extra exhibit of Colorado minerals will be sent to the London (England) Exhibition, the matter being now under consideration by the Denver Mining Exchange and Chamber of Commerce.

THE GRAND RIVER COAL AND COKE COMPANY.—This company, which is carrying on operations in Thompson's creek, has, it is stated, lately extended operations further south, as the coking quality of the coal increases in the southern tren of the coal measure. The coking quality of the coal, especially at Spring Gulch, is said to be so superior to any other in Colorado, that already a large market has been found for it at the smelters in Leadville, Denver and in Arizona.

BOULDER COUNTY.

For some time the Denver State Lottery Company has been boring for coal upon the land of Owen Kilker, near Louisville, and the boring firm of Wilson & Son is now said to have reported the discovery of a good vein of coal.

(From our Special Correspondent.)

BOULDER, March 27, 1890

Late advices from Central are to the effect that the California shaft has reached a depth of 2,000 feet, and that the lode is as strong and regular at that depth as at any point above. Owners of "fissure veins" in Colorado naturally watch developments at the California mine with interest. Being the deepest mine in the State, and its record having been carefully kept, its history may, with some show of reason, be supposed to foreshadow approximately the history of other similar mines in this district at least.

I am informed that the 1,900-foot level has yielded a profit of over $60,000 during the last six months, and that the 2,000 bids fair to do as well.

The balance is now against the London office, all of the money sent over since the reorganization having been returned.

The California enjoys the rather doubtful distinction of being the deepest mine in the country, from which all material is hoisted in buckets. It is only fair to Mr. Alfred Rickard, the manager, to say that he does not use buckets from choice.

In marked contrast with the plan of development at the California are those in vogue on the great Columbia vein at Ward, on which half a dozen mines are in successful operations, and on which the greatest depth ever reached was only 510 feet.

The names of the half dozen mines referred to above as being in operation on the Columbia are as follows: The Niwot, Madeline, Columbia, East Columbia, Boston and Utica. They are all good, and all ought to be under one management.

Among the good mines of Ward may be named, in addition to the above, the Baltimore, Attica, Stoughton, Modoc, Colorado, B. & M., Morning Star, Morning Star Extension, Puzzler, Moltke, Gage and John B. Sherman. The above is not by any means a full list, but simply contains the names that occur to me most readily as I write, and is long enough to show that the district is an important one. It is also an old one; but for years development was retarded by high smelting charges and freights. Freights and smelting charges are now fairly reasonable, and if Congress will only let Mexican lead ores alone, the people of Ward district, and of Boulder County generally, will do very well.

Free lead ore from Mexico is what we need and must have if we are to have our dry ores smelted cheaply.

Your position in regard to this matter is right, and people here are gradually becoming convinced of the fact.

We have no lead mines in Boulder County; but most of us have been howling for "protection against Mexican lead," utterly unmindful of the injury that would result to our industries from the so-called protection.

CLEAR CREEK COUNTY.

(From our Special Correspondent.)

GEORGETOWN, March 28.

BUNKER HILL MINING COMPANY.—This company has just been organized on a promising prospect adjoining the Lamartine on the west. The capital stock is placed at $250,000, par value $1. It is the intention to sell a part of the stock at 20 cents per share to prosecute development. It will not be listed on the Denver Mining Exchange.

COLD STREAM.—The Maine lode of this property has been quietly and steadily developed for some time past. An adit has been driven from Cherokee Gulch past the main shaft, a distance of about 1,000 feet. Some good ore has been encountered in this adit; while lessees are finding good ore in the upper levels near the shaft.

PAY ROCK CONSOLIDATED MINING COMPANY.—This company is prosecuting development work vigorously, and is shipping more ore than for a long time. The stock, however, which was listed on the Denver Exchange some time ago with so much flourish at 10c. per share (stocked at $4,000,000, par value $1), with the assurance that it would not be allowed to fall below that point, has been selling at considerably less for some days. The mine is no doubt a good one, capable of paying dividends on a fair capitalization. Mr. Egan's ore statement for February is quite flattering, but he fails to state how much of the amount produced the company actually received, as much of the ore was mined under lease of which the company would receive but 35 per cent. or possibly 40 per cent. We have no desire to be unjust toward this company or its mining, but the manner of handling the stock would indicate a sort of manipulation that is not reassuring.

PELICON-DIVES.—This property, so famous in the early days of mining in this county, shows more activity than for some time past. Mr. Lawrence seems to be infusing new life into the operation of the mine, which will doubtless be the means of restoring it to something like its past greatness.

GUNNISON COUNTY.

MOUNTAIN KING.—This mine, near Crested Butte, has been leased and bonded for $15,000.

JEFFERSON COUNTY.

DENVER NATURAL GAS AND OIL COMPANY.—Mr. J. C. Blood, Superintendent of this company, who went to Ohio recently to purchase machinery, as mentioned in our last issue, has reported that he has purchased all machinery first class, and it will be shipped to Denver at once. This refers only to machinery that could not be procured at Denver. Everything that could be bought at home was purchased before Mr. Blood started East.

LAKE COUNTY.

IRON SILVER MINING COMPANY.—Arguments in various cases in which this company at Leadville is the plaintiff were heard last week in the Supreme Court at Washington. There are four of these cases involving the title to the Sierra Nevada and Mike & Star and other lode claims located on the Moyer Placer claim, owned by the Iron Silver Company. The company takes the position that it is entitled to all the mineral found in the ground covered by this placer claim, while its opponents take an adverse view and claim that a placer claim does not cover lode locations. Judge Pond, Senator Wolcott, and Judge Dixon represent the Iron Silver, while T. M. Patterson and Senator Teller are the opposing counsel. Teller appears only in the case of Campbell vs. the Iron Silver for the possession of the Sierra Nevada property.

LAS ANIMAS COUNTY.

BOURNE CEMENT AND PLASTER COMPANY.—The cement works at Trinidad have been purchased by this company, which will at once enlarge the works, so that the establishment will be able to produce one thousand barrels of cement daily. The company intends to manufacture three grades of cement. The first and principal product will be Portland cement, which is made from a natural product found in this vicinity, where the company owns a large body of land. Second a plastering cement, similar to the Acme, which is made from the same material by a somewhat different process. The third product is a hydraulic cement, made from the same material with the addition of another product found in Trinidad and resembling a soft blue shale. Mr. Bourne, the superintendent, has been identified with the cement business for over twenty years. He established the present works in Trinidad seven or eight years ago, and managed them for a time.

LARIMER COUNTY.

BONANZA KING GOLD MINING COMPANY.—This company, recently organized, whose properties are at Manhattan, has let the contract to sink a 50-foot shaft with two cross-cuts. The Bonanza King is said to make a good showing, and if the prospects continue favorable, a $20,000 plant of machinery for treating the ore will be erected. The incorporators of this company are Sandford Stark, D. R. Maclean and Granville Malcolm, of Denver.

ELKHORN GOLD MINING COMPANY.—This company will begin work this month on three of its properties at Manhattan.

OURAY COUNTY.

AMERICAN MINING COMPANY.—This company, which has been taking out ore at the rate of about $1,000 per day for more than three months, struck a large body of ore recently, which is reported to run 40 per cent. lead and from 20 to 30 ounces in silver per ton. In addition to this the ore carries about $2 per ton in gold and iron enough to flux it.

PITKIN COUNTY.

Aspen is, it is said, about to have a public concentrator. Messrs. J. Schueler and M. Stockder, proprietors of the Aspen Public Sampling Works, are said to be making arrangements to build a concentrating plant on the site of the old sampler. The sampler will also be run in connection with the concentrator. The process by which these gentlemen expect to concentrate ore is the result of Mr. Stockder's experiments for several years in the Hartz mountains in Germany.

COMPROMISE MINING COMPANY.—Messrs. Beach & Percy, proprietors of the Rust Public Sampling works at Aspen have contracted to take 5,000 tons of ore from this company.

SAN MIGUEL COUNTY.

VALLEY VIEW.—This mine has been leased to a St. Louis syndicate. A vein runs across this property, and has been shown up to a considerable depth.

IDAHO.

Prof. Geo. C. Munson has about completed his shipment of the additional portions of the 100 stamp mill for Mr. De Lamar's mines at De Lamar. It will be complete in every respect. Two or three carloads of high grade ore are received at Denver from the mines weekly.

CUSTER COUNTY.

(From an occasional correspondent.)

The Badger mines, owned by Messrs. J. B. Haggin, of San Francisco, and R. C. Chambers, of Salt Lake, managed by Mr. M. L. Crafts, adjoin the Dickens-Custer property, and is supposed to be on the Custer lode. It is developed by a shaft 500 feet deep, by drifts and tunnels 1,000 feet along the course of the vein. In years past many thousand tons of ore were extracted, and reduced at Custer mill. Fifteen men are employed on development work, it is reported. Each month ore to the value of $10,000 is exposed. This accumulation will probably compel the owners to erect reduction works.

DICKENS-CUSTER MINING COMPANY, LIMITED.—This company controls a group of 12 locations, containing 200 acres, covering 7,500 linear feet of the General Custer lode; also two groups of mill sites. On one is the 30-stamp dry-crushing mill, now in operation, on the other the Charles Dickens arrastra. The Custer mine's workings aggregate 12,000 feet of tunnels and drifts, proving the continuity of the lode for 6,000 feet and 800 feet below ridge of hill, across which run outcrop passes. The foundation is feldspar porphyrite, the vein, quartz and spar, 4 to 20 feet wide, carrying silver and iron sulphides and assaying about equal value in gold and silver. It is faulted by basalt dykes. The ore extracted has yielded $5,000,000. Since Mr. Robert Robinson, general manager, and Col. A. H. Axford, resident director, took charge in August last, the 30-stamp mill has been running continuously, and will probably do so for an indefinite period. The company's pay rolls number 115 employés; a large force of wood-choppers, teamsters, etc., is also indirectly employed. When spring fairly opens, it is generally believed that shafts will be sunk below the present levels and adits run, enabling extraction of ore from the 6,000 feet of vein now opened. These improvements will necessitate increased milling capacity. At present but relatively a small amount of the stoping ground is economically available. The ore is transferred from the mine bins in wagons to the head of a chute 400 feet long, partially above and under ground, and from the bottom of chute by cars to the elevated wire rope bucket tramway, 3,000 feet long, which conveys it to the mill. The Charles Dickens mine, owned by this company, is upon the same system of veins. Remarkably rich and extensive ore bodies, several hundred feet long, were extracted near the surface. The vein is continuous in depth, not at present in richness. Fifteen miners are engaged prospecting, with every indication of ultimate success.

IDAHO COUNTY.

CLEVELAND MINING COMPANY.—The Cleveland and Anchor mines, owned by this company, are located in the Alton mining district, which lies south of the Cœur d'Alene district, about 30 miles southeast of the old Warren's Diggins. The company is organized under the laws of Montana and has a capital stock of $2,000,000, shares $5

each, non-assessable. Dr. J. M. Merrill, one of the owners of the Granite Mountain and Bi-Metallic properties, Montana, examined the Cleveland and Anchor and reported so favorably that a Butte, Mont., syndicate took a large block of the stock. The work carried out by the superintendent was outlined by Dr. Merrill, and the results obtained confirm his reports. The property is developed by a 220-foot tunnel, the main vein being crosscut at a depth of 300 feet. In running the tunnel the first vein was cut about 75 feet from the mouth of the tunnel, and to facilitate work on the main vein an upraise of 90 feet has been made to the surface on the first vein, which shows an average pay streak of two feet. The company is about to determine about the erection of a mill and other important matters.

ILLINOIS.

VERMILION COUNTY.

Three hundred miners and mine laborers met in Danville on the 1st inst., and formed local unions, representing Kelleyville, Grape Creek, Tilton and Danville. They demand the eight-hour rule to go into effect May 1st. It is said that they will be supported by the American Federation of Labor.

MICHIGAN.

IRON MINES.

MINOWAN IRON COMPANY.—This company, of which A. L. Conger, of Akron, O., is president, has made what seems to be an important iron discovery on its property on the Cascade range. The tract in question is the north half of the southeast quarter of section 28-47-26, and lies about one mile east of the Wheat mine. On the surface the ground is a tamarack swamp and the ore is overlaid by 20 to 40 feet of sand. The ore body as far as located is 1,000 feet in length by about 50 feet in width. A novel method of exploration was pursued, only possible when the ground is of the nature this is. A number of iron pipes were driven through the sand to the ore. About fifty of these pipes were put down and the course of the vein followed in this way. A test pit has been sunk and is bottomed entirely in ore. Steps are being taken to equip the mine with machinery when the shaft will be sunk about 50 feet and cross-cuts put in from the bottom.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, March 31.

The week ending Saturday, March 29th, was a fairly active one in the mining industry. The weather was favorable excepting a heavy windstorm on Thursday. A large amount of ore was mined. Much of it, however, remains on the dumps, as the prices offered by the ore buyers are considered a little low, the ruling price for the week being $23 to $24.50. The following are the sales from the different districts as far as reported:

Joplin mines, 831,810 lbs. zinc ore and 122,360 lead. Value, $12,611.50.

Webb City mines, 1,232,790 lbs. zinc ore and 32,060 lead. Value, $15,311.

Carterville mines, 661,560 lbs. zinc ore and 53,705 lead. Value, $9,117.

Zincite mines, 315,870 lbs. zinc ore. Value, $3,857.

Lehigh mines, 132,000 lbs. zinc ore. Value, $1,460.

Galena, Kan., mines, 542,380 pounds zinc ore, and 37,020 lead; value, $6,855.

All districts, total value, $49,211.50.

Mr. Waters Van Ness, a prominent mining and civil engineer, has just arrived from Kansas City and formed a partnership with Captain Halibaugh under the style and firm name of Halibaugh & Van Ness. They also have a branch office in rooms 12 and 13 of the Kansas City Mining Exchange.

Judge O. N. Hilton, of Denver, Colo., is looking over the lead and zinc mines.

BELVILLE.—The Standard company is preparing to sink a test drill hole on their land.

Watkins & DeGraff, operating on the Holden land, are busy putting up a plant of steam jigs.

The pumps on the Holden land are running steadily, and will soon have the mines drained so that the miners can get to work.

Pat Murphy land produced for the week ending March 29th, 183,340 pounds zinc ore that sold for $2,167.66. This land has been a steady producer for the past four years. Recently Mr. Murphy has had a drill-hole put down that shows a body of lead at a depth of 100 feet, and he has just made arrangements to test with a drill at other points on the land.

Mr. Carl Henrich, superintendent of the Victory mines, and Mr. John Murphy, a mining expert of Colorado, called on the JOURNAL correspondent at his Joplin office. We are always glad to meet the Western mine operators and show them our lead and zinc mines.

Mr. John Price Wetherell, vice-president of the Empire Zinc Company, is in the city looking over its mining and smelting interests.

The South Joplin Lead and Zinc Company has started up its new jig plant on crush ore from its dump pile with satisfactory results; the underground development shows a large face of free and disseminated zinc ore.

The Empire Zinc Company ran its steam jigs only three days during the past week and cleaned up $3,000 worth of ore.

The Diamond mines of A. H. Frye, southwest of Joplin, are putting up a plant of crusher and rolls.

LEHIGH.—Mr. Johnson's new plant of machinery started up last week, and is reported to have worked smoothly, and as a result we will soon expect to see a large output.

Some Boston capitalists have recently purchased mining lands near Lehigh, and tested it by drilling and found the ore. They will now put up a steam hoisting plant and sink a shaft.

The pumps at the old Sherwood mines are steadily gaining on the water at the rate of about seven feet per day, and the miners are making surface improvements and repairing their old shafts preparatory to active work.

Webb City mines still continue to head the list as the largest producers, and the old reliable Center Creek Company takes the lead by producing 1,190,970 pound zinc ore and 28,210 lead.

Carterville mines keep up a steady output regardless of the fluctuations of the price of ore.

MONTANA.

DOG CREEK PLACER MINING COMPANY.—The acquisition of the Meadow Creek Placers by this company was consummated some time ago. The company was incorporated with a capital of $1,000,000, shares $5 each. Mr. John T. Williams, assisted by John E. Orr, will have direct charge of opening up and operating the property. Extensive developments, it is said, will be undertaken the present season.

DEER LODGE COUNTY.

DEER LODGE MINING AND SMELTING COMPANY.—At the annual meeting of this company, held in Deer Lodge recently, the following officers were elected for the ensuing year: President, Edward Simpson; vice-president, George H. Casey; secretary, John Fisher; treasurer, R. T. Kennon.

The mine worked by the company is the Hidden Hand, about eight miles from Deer Lodge. The main incline has been sunk to the depth of 110 feet.

LEWIS AND CLARKE COUNTY.

JAYHAWK MINING COMPANY, LIMITED.—This company, of London, England, is about to commence work on its property in the Lone Pine district. A new hoist calculated to hoist rock from a depth of 300 feet has been purchased. The company has also purchased a second-hand 15-stamp mill from Helena parties.

MISSOULA COUNTY.

IRON MOUNTAIN MINING COMPANY.—The trustees of this company met recently and decided not to ship another pound of ore until the Northern Pacific Railroad builds the proposed branch to a point within easy reach of the mine. It has necessitated three different hauls to get the ore to the reduction works; first by wagon or sleigh, then by boat, and lastly by rail. This has been expensive, and as the railroad can be built within a short distance of the mine, and the location of the track is said to be already made, the company will wait until this is done. Meantime development work will go on and be prosecuted with vigor.

NEVADA.

The Comstock Mill and Mining Company has filed its petition, and Judge Rising has ordered that all parties claiming water rights on the Carson River and its tributaries appear before him in Carson City on June 2d, and offer evidence in support of or against any claims to the waters of said river, and that the court will consider all such evidence. This proceeding will compel ranchers to offer evidence in support of or against the claims of their neighbors, and the suit being commenced on the heels of the suit brought by the Union Mill and Mining Company, involving the same rights, gives it much significance. This adjudication of rights is a measure of the utmost importance to the people of Carson Valley. There are 235 defendants included in the suit, embracing residents of Lyon, Ormsby, Douglas, and Churchill counties.

LINCOLN COUNTY.

In the vicinity of Patterson is said to be a heavy belt of oil shale cropping out a distance of more than one mile, and presenting the appearance of a great coal bank. Small pieces of this shale placed in a hot muffle will, it is stated, burn for several minutes with a clear oil flame. This is important, since about all the shale used in the manufacture of gas on the coast is imported from Australia.

DAY SILVER MINING COMPANY.—It is reported on good authority that W. S. Godbe has purchased all the property in this county of this company. This embraces the Hillside, Jack Rabbit, Mondha and Hamburg mines, the Bristol smelter and all the mines belonging to the company. These mines in the past have turned out good ore, and have so far been worked but a short distance below the surface. The Jack Rabbit or Day mine is said to contain fine fluxing ore in large quantities. The purchase price was not directly mentioned, but it is said to be $30,000.

PIOCHE CONSOLIDATED MINING COMPANY.—This company continues drifting east and west from the crosscut on the Black Ledge at the 1,500-foot level, and is said to have found free smelting galena ores in the face of the west drift, similar in character to the larger body found in the east drift. The displacement of the refractory zinc ores by free-smelting galena is an important indication and valuable in itself. The company struck recently, about 200 feet from the mouth of the tunnel on its Zero claim, a six-inch vein of lead ore showing galena, carbonate of lead, and peroxide of iron.

NEW MEXICO.

GRANT COUNTY.

CARLISLE GOLD COMPANY, LIMITED.—This company of London, operating the Carlisle gold mine, has been closed down. It has been making but a small margin above actual operating expenses for over a year. Last fall Superintendent Longmaid resigned and his successor attempted, by curtailing expenses, to keep the mine in operation, but it is said the ore was too low grade to work profitably.

MAMMOTH GOLD MINING COMPANY.—This company, recently organized at Galveston, has purchased a group of mines at Pinos Altos, and will build a 10-stamp mill near the mines this summer. It is asserted that water enough can be obtained where it is proposed to build the mill, for milling purposes at all seasons of the year.

RIO ARRIBA COUNTY.

KENDALL MINING COMPANY.—J. T. Hagan, vice-president and superintendent of this company, has shipped a 54-inch turbine water wheel to the placer mines on the Chama. This wheel is to operate a 10-inch Hall pump. One thousand gallons per minute is claimed to be the capacity of the pump, which discharges through a hydraulic nozzle.

NORTH CAROLINA.

Mr. Thomas Edison has taken options on a great many properties in this State, and so far has with his expert visited many of the mines. For years he has been working in his laboratory on a process for working old sulphurets.

OHIO.

ALLEN COUNTY.

A dispatch from Lima says that the biggest oil well that has been drilled in that field since the famous Tunget well four years ago was finished on the 30th ult. The well is on the Parker farm, four miles east of Lima, and is only nine feet in the sand. It is said to be flowing at the rate of 1,500 barrels per day. The well opens up a large amount of new territory. The Tunget well has produced since it was drilled between 700,000 and 800,000 barrels of oil, and is now doing over 100 barrels.

PENNSYLVANIA.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to March 28th, were as follows:

	1890. Gals.	1889. Gals.
From Boston	535,362	818,083
Philadelphia	24,511,061	30,875,800
Baltimore	1,202,754	3,203
Perth Amboy	1,481,269	4,647,888
New York	83,536,484	93,997,900
Total exports	111,266,933	130,342,874

UTAH.

JUAB COUNTY.

MAMMOTH MINING COMPANY.—This company has elected officers and directors as follows: President, William McIntyre; vice-president, J. A. Cunningham; treasurer, L. S. Hills; other directors, H. P. Nason, W. M. Bradley, S. McIntyre, T. W. Jennings; secretary, J. P. Corker. The directors were instructed to list the stock of the mine on either the London or New York Stock Exchange, but it is thought preference will be given to the New York Exchange,

SALT LAKE COUNTY.

SOUTH FORK CONSOLIDATED MINING COMPANY. This company has been organized for the purpose of doing a general mining, milling and smelting business, with headquarters at Salt Lake City, and the charter will give the company the privileges extending for 50 years. The capital stock is $50,000, shares $1 each.

WYOMING.

ALBANY COUNTY.

OTRAS MINING COMPANY, LIMITED.—This company has been organized with a capital stock of $1,000,000, shares $100 each. The incorporators are Leonard Sartoris, Lionel Sartoris, Frank Sartoris, Wilbur C. Knight, M. B. Dawson, George F. Morgan and C. W. Wilkinson. The directors are Lionel and Frank Sartoris, W. C. Knight, M. B. Dawson and C. W. Wilkinson. The object of the company is to take charge of all the mining property now owned and controlled by Sartoris Brothers. This includes the Keystone mine and various placer claims. It is probable that the company will also acquire other property in the Douglas Creek district. The main office will be at Laramie.

FOREIGN MINING NEWS.

BELGIUM.

Reports from Brussels, dated March 21, state that the strike of the coal miners at Charleroi is spreading. The Labor League has presented its ultimatum to the mine owners, demanding an advance of 15 per cent. in wages.

CANADA.

PROVINCE OF ONTARIO.

(From our Special Correspondent.)

PORT ARTHUR, March 24.

Mr. R. R. Paulinson has returned from a trip to his iron lands in the vicinity of Silver and Arrow lakes. He brought in some magnificent samples of iron from several of his locations. He left a gang of men at work erecting houses on three of his locations. His intention is to test and prove up all of his property from Silver Lake to the boundary, and all the tests that have been made so far have been highly satisfactory.

BADGER SILVER MINING COMPANY.—A dividend of five per cent. on the capital stock of the company was paid February 15th, amounting to $12,500, making its dividends for 1890, up to date, $37,500. Its February shipment amounted to $15,000, and it is expected that the March shipment will exceed that sum. Drifting is being carried on westward on the lower level, and is now in 300 feet from the shaft. The vein increased from 4 feet at the shaft to 7 feet at the breast of the drift, and is carrying good pay ore, composed of blende, argentite and native silver. As soon as the compressed air plant is installed the working force will be largely increased. At present seventy men are employed.

BEAVER MINING AND MILLING CO.—The diamond drill has been put down to a depth of 1,250 feet below the bottom of the mine, and the explorations made by means of it have been highly satisfactory. Capt. Hooper is now operating it from the surface; it is his intention to test the Beaver vein at various points from where the drill is at work up to the present workings. About 300 feet of drifting has been done on the North Bluff vein, and while the ore is of a low grade, it gives promise of developing into a bonanza. Capt. Williams, who has charge underground, is timbering up the slopes in the Beaver. He has eight completed. Capt. Hooper estimates that he has 20,000 tons of milling and shipping ore ready to be stoped. The engineers are pushing the repairs on the mill, and expect to have everything in readiness to start it up by the 15th of April. Its capacity is ten heads of stamps, and will be doubled about the 1st of May, and if the developments turn out as they are expected to at the North Bluff vein its capacity will be trebled. The increased amount of water necessary for its increased capacity will be brought by syphon from a lake on North Bluff as soon as the mill starts. The force of miners will be largely increased, and there are facilities for hoisting 30 tons of ore per hour. The March shipments will reach $20,000.

BLACK HAWK.—This property is situated on Lot 10, Con. 1, township of Gillies, and is owned by Messrs. Buchannan & Getchel, of Glencoe, Minn. The vein is four feet wide on the surface, and gave assays at the various outcroppings of from $8 to $15 per ton. The vein consists of fluor-spar quartz, calc spar, zinc blende, and argentite; test pits have been sunk 40 feet, but had to be abandoned on account of water. In the spring steam pumping machinery will be put in and the property thoroughly tested.

IRON MOUNTAIN.—This valuable deposit of iron ores on the west side of the Attic Okan River, about three miles south of the confluence of the Partridge and Seine rivers, and about 32 miles west-southwest of the crossing of the Canadian Pacific Railway and the Fire Steel River. The deposit is 300 to 400 feet wide, nearly a mile long, and rises for the greater part to an elevation of over 100 feet above the plain of the mountain. The iron ore constitutes a thickness of from 50 to 150 feet, divided in places into two and three veins, with a vertical dip. Along the strike of the lode, for several miles, the same rich ore outcrops in several places, and is in some cases very large. The ore has been thoroughly analyzed by Prof. Chapman, of Toronto, the Union Steel Company, of Chicago, and others. The deposit has been examined by Dr. Bell, of the Geological Survey; D. H. Bacon, Superintendent Minnesota Iron Company, Tower, Minn.; Peter McKellar, F. G. S.; W. W. Russell, M. E., and H. A. Wiley, an expert of long experience in this district, and all pronounce it to be one of the largest deposits of iron ore known on this continent. It is understood that the Canadian Pacific Railway intends to construct a branch line into this district at once, as its preliminary examinations have resulted very satisfactorily.

SHUNIAH WEACHU MINING COMPANY.—The annual general meeting was held in Liverpool, February 24th. The report stated that during the past twelve months the recommendations of Mr. Rolker, who had made an examination of the property, had been followed by the manager, and had resulted in most favorable developments. Attention had been chiefly concentrated on the following work: Sinking No. 3 shaft, sinking a new shaft (No. 4) near the western boundary and driving a level from No. 3 to No. 4 shaft. No. 3 shaft has been sunk to a total depth of 610 feet. The vein has varied from 6 to 13 feet in width, giving low assays of silver. No. 4 shaft has been sunk to a depth of 166 feet. Good ore was struck at a depth of 46 feet, and has continued (with a break of about 10 feet) to the bottom of the shaft. At a depth of 90 feet two levels, east and west, were started, and passed through good ore for a total distance of 91 feet, which may be taken as the width of the ore body at that point; stoping has been carried on above these levels, and this point has, up to date, produced 750 tons of mill rock and 96 barrels of shipping ore. The manager estimates the ore already in sight at this point at 3,000 tons, which should produce 300 barrels of shipping ore. The remainder being mill rock. Two new levels are now being started at the bottom of No. 4 shaft, which will permit of the extraction of the ore between them and the higher levels. No. 1 level west from No. 3 shaft, is being driven about 90 feet below the surface, just under the trap formation. The level has passed through more than 200 feet of pay ore, some of which has been very rich; but as this deposit has not been proved in depth, no reliable estimate of value can yet be formed, and orders have been given to sink a winze from this level, in order to test this point. The mill rock on hand at this date is estimated by the manager at over 3,000 tons, the ore in sight in No. 4 shaft at 3,000 tons, besides the large body of ore in No. 1 level, west from No. 3 shaft, which is not yet estimated.

WEST END MINING COMPANY.—This company is now sinking a deep winze and raising some very rich ore. The pay streak is 14 inches wide, and will average from $1,000 to $4,000 per ton. Ten barrels of ore, the value of which I am unable to give you, were shipped this month.

CENTRAL AMERICA.

GUATEMALA.

A contract has been made between the government of Guatemala and H. L. F. Cottu, representative of a French syndicate, for the construction of the Northern Railroad, of Guatemala, extending from the capital to the Atlantic Ocean.

GERMANY.

The miners of Saarbruck have adopted a resolution declaring that they will not send delegates to the Brussels Labor Congress. The resolution further declares that the Saarbruck miners do not acquiesce in the Belgian workmen's programme, which they declare is excessive and arbitrary, and credits the recent Berlin Labor Conference with an earnest intention to promote the welfare of workingmen.

JAPAN.

Mr. N. Tomonari, civil engineer of the local government of Hokkaido, Japan, stated in a recent interview that a Japanese syndicate in which the Government is interested, with a capital of over $7,000,000, has been formed for the purpose of developing the coal mines of Northern Japan. The project includes the construction of a railway system, and this work Mr. Tomonari has in charge. The company will develop the Sorachi and Yarbari mines to such an extent that Japan will export coal to China and America. The mining of coal has been carried on for thirteen years, though on a small scale; some has been shipped to San Francisco.

MEXICO.

The discovery of rich deposits of silver ore near Batopilas, is reported.

CHIHUAHUA.

DON ENRIQUE MINING COMPANY.—A dispatch from El Paso, Tex., says that on March 29th the reduction works of this company—formerly the Cusihuiriachic Mining Company—situated about fifty miles southwest of Chihuahua, were totally destroyed by fire. The cause of the fire is not known.

SANTA JULIANA MINING COMPANY.—From the circular just issued to the stockholders, we take the following: It has been decided to raise $25,000 more for the carrying on of work by offering treasury stock at $12.50 a share, or, to those who prefer it, coupon notes of the company of the same form as those sold in accordance with the circular letter of December 18th last, except that the notes are to be dated April 1st instead of January 1st, and forty shares of stock will be given as a bonus with every one thousand dollar note. No stock will be sold or notes offered on these terms after this amount of money is raised. The price of the stock has constantly and steadily increased from the time the work was commenced on the shaft until now, and we expect it will continue to do so as constantly and steadily, though more rapidly, in the future. The developments made during the past four months are reported to be favorable. After the little mill gets running, it is thought the mine will be self-sustaining. A report dated March 24 shows that $18,832.50 was raised from sale of the stocks; $48,046.67 from sale of notes, and $1,431.81 from settlement of claim against H. Norwald, a total of $68,310.98. The disbursements have amounted to $65,058.61, leaving a balance in the treasury of $3,252.37.

LOWER CALIFORNIA.

(From our Special Correspondent.)

Messrs. Kerr & Son, at Alamo, received a Wiswell mill from San Francisco and it will be running about April 1st. Another is expected a month later. Their engine is 16x24 feet, 60 h. p., and is capable of running four Wiswell mills with Gates' rock crusher. One mill will be used to crush ore from the Asbestos, Jeff Davis and Americana. The other, when it arrives, will do custom work. Concentrators will be attached.

The Lucas mill in Mexican gulch is running on ore from the Centipede, Visnagre, and Nuestra Senora de Guadalupe mines.

The El Paso Company's mill at Alamo is running steadily, and it is said to be turning out considerable gold.

The Lane mill, at the same place, is running on Aurora ore, averaging $40 to the ton.

The Temescal tin mines in the Temescal district, which have been in litigation for some time, have not yet effected a settlement, but it is hoped they will do so soon.

Ex-Governor Ryerson has bought all of O. P. Read's interest in the Reed, Wisconsin, Dora, Mittell, Arabella and Hattie mines.

Antimony has been found near Alamo, but the percentage has not yet been ascertained. The failure of the old mines in Asia may make this discovery valuable. A company is organizing to work silver mines at San Borja below Ensenada.

At San Isidro an iron mine is being opened up, the intention being to put up a smelter on Coronado beach, San Diego, to work it. The Grande mine is being worked by contract, Messrs. Miller and Cunningham being the contractors. It is a big ledge, and drifting is in progress on the 50-foot level.

CEDROS ISLAND MINING COMPANY.—This company is building a wagon road to its mines, having found the old method with teams too expensive. It has a schooner running to the Cedros Island, and intends to have a steamer running in a few months if it can buy a suitable one in the East. The ore on the surface is known as cenesis, a kind of volcanic ashes; the ledges, however, are regular and of considerable width. The ore is not, strictly speaking, free milling; a large percentage is very fine, and special means are required to work it. Iron is found on the island, some of it being chromate.

PRINCESA GOLD MINING COMPANY.—This company has been registered in London with capital of £125,000. It has acquired and is working claims in Alamo with 30 men under Superintendent Rodda.

SAN SELMO COMPANY.—This company has made a contract to open up its silver and copper properties.

SONORA.

According to the *Mining and Scientific Press* of San Francisco, an action has been commenced by the Oro Grande Company (the incorporated name of the company purchasing the Mulatos Gold Mine), for a recision of the contract of sale, the plaintiffs desiring to return the property and regain their money.

The plaintiffs allege in their complaint that the samples of ore given by the owners or their agents to the purchasers had been tampered with, or, in the familiar phrase of the miner, had been "salted," and that they had in consequence been swindled. The complaint also prays for an injunction restraining the defendants from disposing of any of the money or securities turned over to them.

It is stated that Alexis Janin and D. B. Gillette reported on the mine, but the samples were "salted" on them. Mr. Janin, in a card, explained that he examined the mine for other parties two years ago and reported the average yield as $5 per ton, and advised sampling by millrun and not assays.

Mr. Janin's report was to Smith & De Crano, and not to Hayward & Hobart, and his principals declined to purchase, since which time he has had nothing to do with the matter.

(From an Occasional Correspondent.)

From La Plomosa I went to La Mina Promontoria, or Sumacocora, some ten miles north. This mine is on a vein running northwest and southeast, cutting down through a hill of some 350 to 400 ft. in height, situated on the north side of a precipitous arroyo, running to the west or northwest, and containing at all times a little running water. The top of the hill shows very extensive old workings, and there is a tunnel from 50 feet above the arroyo and 600 feet long cutting the vein. Owing to the absence of the owner, I was refused admittance to the mine, as it was then bonded to some English capitalists. The ore contains lead, galena and sulphide of silver, and I am told some chloride, but I did not see any. It has to be smelted. From this point I followed up arroyos and over the mountains to Nogales again, a distance of twenty-five miles.

Americans who complain of the United States duties should see Mexican customs houses, with swarms of employes, and with duties of 100 to 300 per cent. on cost. A prospector who had two pairs of blankets, unmistakably his bed, paid $7 duties on one pair of blankets, which in St. Louis would cost retail perhaps $6. I shall have occasion to refer to this subject later on as it is one of prime importance to all foreign mining men in Mexico. But to pass the lines successfully, baggage, bed *i. e.* blankets, etc., should be taken to the examining room two or three hours before the departure of the train, state fully and carefully the business you are going on, and how long you will be gone, unlock and show as asked, and see that stamps are put on articles before you move them.

I always camped in the country where I could get firewood, and carried corn and also brought sometimes fodder for horses. There is very little rain, except for two months in summer, and same in winter; but you are just as well off there in camp, as I doubt if there are 300 houses in all Sonora which will shed a heavy rain. The roofs are universally mud, and a steady half day's rain runs through any of them. It is necessary to carry water for drinking and cooking and washing. Wash dishes and towels are apparently unknown except in the principal houses or towns, and with about four-fifths of the population are not used at all.

From Nogales I took the Sonora railway to Querobabi, 103 miles south, where I got a carriage and went to Querobabi gold mine, 9 miles east. This vein shows for half a mile on the surface. At the west end it is 10 inches thick, widening at a depth of 60 feet to 8 feet. In the middle and east end some two feet at surface, but does not increase to depths of 10 to 20 feet. A mill test did not go high, but it might do better in pans. Water scarce. but fuel was quite plenty.

Next I went 12 miles south to San Geronimo—a silver mine. This vein, at the surface some two feet, widening at 150 feet to 4 feet or more, has had above main level some rich ore, but worked out to 100-foot level, and below that filled with water. A good five-stamp mill, engine and boiler in fair order. This mine is bonded to New York parties, it is said.

The San Ricardo gold mine is three miles east and two miles west of San Miguel River. It belongs to and is worked by a Cleveland, Ohio, company. There are five veins on this property from 3 to 15 feet thick each, and, strange as it may seem, they are granite instead of quartz. I think from appearances the value in gold is in pockets and in sulphides. It is easily worked, and I am told that it yields some $10 per ton. There is a good 20 stamp mill, Frue vanners, engines and boiler, and works 50 tons per day. This mill and company has had a peculiar history. One superintendent, by name of Fatmu, a Sunday school superintendent also, is credited with stealing some $67,000. He got out of Mexico in the night by hiding in a box-car of ore from Hermosillo Junction to Nogales, and Mexico will see him no more. The San Ricardo Company now seems to be in a prosperous condition with a supply of good ore, and honestly managed.

The Socoro, a silver mine, fifteen miles southwest, is worked in Mexican fashion, and is a little more than paying expenses.

NOVA SCOTIA.

QUEENS COUNTY—MALAGA DISTRICT.

There are at present four mines actively engaged in gold mining in this district.

Considerable prospecting is being done on undeveloped property, and there is every prospect of great activity in this district during the coming season.

Work at the Parker & Douglas and Caledonia mines is being rapidly pushed under the able supervision of Mr. Gilbert Parker, of Philadelphia, president of each of these companies.

An occasional and well-informed correspondent sends the following notes:

BOSTON GOLD MINING COMPANY.—The company is developing its property and taking out some very good ore. Work will be commenced on its mill as soon as the season will permit.

CALEDONIA MINING COMPANY.—The company has its new ten stamp mill running, and is taking out some of the richest ore that has been produced in this district. It is now prospecting the ground at the depth of 100 feet with a diamond drill.

MALAGA MINING COMPANY.—The company has a twenty stamps running full time. A contract has been let to drive a tunnel from the famous Rabbit lode to the South Rabbit. The second paychute has been struck at a depth of 130 feet in the main shaft, on the Rabbit, and is turning out three ounce ore. Mill returns for February on this lode show a yield of two ounces, 12½ dwt. per ton. The other lodes on this property are fully up to the standard this month.

PARKER & DOUGLAS MINING COMPANY.—On this property there are two air drills in operation, and the number will be increased as soon as their new compressor is in place. They are running ten stamps and will have two more in operation in a few days. The company has a Golden Gate concentrator on the ground and is erecting a suitable building for it.

RUSSIA.

Siberian papers announce that several high officials in the mining districts of Chita and Verchniovdinsk, including two owners of gold mines, have been imprisoned for peculation and bribery.

MEETINGS.

Cleveland Mining Company, at the office of J. B Lealey, No. 2 Grix block, Butte City, Mont., April 8th, at 2 P. M.

Iron Silver Mining Company, at No. 23 Broad street, New York City, May 6th, at 12 o'clock noon.

Louise Mining Company, at Room 26, Pittsburg Block, Helena, Mont., April 22d, at 4 P. M.

Pecos Mining and Milling Company, at Aspen, Colo., April 17th, at 10 A. M.

Sophia Lode Mining Company, at the office of J. D. McCutcheon, over the Montana National Bank in Helena, Mont., April 15th, at 4 P. M.

DIVIDENDS.

Caledonia Gold Mining Company (Black Hills), dividend No. 17, of eight cents per share, or $8,000, payable April 15th, at the office of Laidlaw & Co., No. 14 Wall street, New York City. Transfer-books close April 5th and reopen April 16th.

Cœur d'Alene Silver-Lead Mining Company, dividend of four cents per share, or $20,000 payable April 21st, at the office of Hoge, Brownlee & Co., Butt, Mont. Transfer books close April 17th and reopen April 22d.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Alabama, Nev.....	1	Mar. 18	Apr. 22	May 13	.08
Bailey, Nev.....	1	Mar. 18	Apr. 22	May 13	.08
Butte King, Cal....	1	Feb. 13	Mar. 20	Apr. 12	.03
Confidence, Nev....	15	Mar. 12	April 6	May 7	.75
Crown Point, Cal...	3	Feb. 27	April 2	Apr. 21	.05
Drytown, Cal.....	6	Feb. 8	Mar. 9	Apr. 9	.02
East Best & B., Nev.	1	Feb. 11	Mar. 14	Mar. 31	.25
Eureka Con., Nev..	1	Feb. 24	April 5	Apr. 21	.03
Goodman, Nev.....	7	Feb. 15	Mar. 25	Apr. 26	.05
Happy Valley, Cal..	6	Feb. 12	Mar. 24	Apr. 14	.05
Holmes, Nev.....	11	Mar. 12	Apr. 17	May 8	.25
Humboldt.....	1	Mar. 18	Apr. 22	May 13	.08
Martin White, Nev.	23	Feb. 12	Mar. 31	Apr. 30	.25
Mayflower, Cal.....	46	Mar. 8	Apr. 10	May 1	.50
Quaker, Cal.....	18	Mar. 8	Apr. 15	May 5	.20
Standard Con., Cal.	2	Mar. 4	Apr. 16	May 19	.25
Union Con., Nev....	40	Mar. 5	Apr. 10	Apr. 30	.25
Utah Con., Nev.....	9	Mar. 11	Apr. 17	May 5	.25

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 401 and 402.

NEW YORK, Friday Evening, April 4.

There is a demand for good stocks, but this is nothing new to record. The market has been livelier than for some time past, but the boom expected by some has failed to materialize, and there is no particular reason why optimistic views as to the future should be indulged in.

On the Consolidated Stock and Petroleum Exchange on Saturday official announcement was made that the Board of Directors had voted to clear mining shares hereafter through the Consolidated Clearing House.

The new departure, however, will be confined to such stocks as are already listed or may be hereafter listed on application, and will be optional with the various companies themselves. The proposition to clear mining shares has been agitated for some years past, but has always met with more or less opposition.

The Consolidated Clearing House, connected with the Consolidated Stock and Petroleum Exchange, at its annual election this week, the following managers were chosen: H. R. Lounsbery, Samuel White, Jr., M. E. de Aguero, C. H. Badeau, C. K. Couillard, S. F. Strong and Dudley S. Anness. The board organized by electing H. R. Lounsbury, president; Samuel White, Jr., vice-president; M. E. de Aguero, Secretary, and C. K. Couillard, Treasurer.

The Comstocks during the week were all weaker and this is not to be wondered at considering the sudden boom of last week. Moreover, it is stated abroad that the strike made in the Potosi, the chief in the late advance did not warrant the report sent out. The California market according to the latest reports is also off a little.

Cons. California & Virginia has declared a dividend of 25 cents; the stock has been steady at from $4.65 to $4.80. Crown Point remained at from $2.20 to $2.30. Gould & Curry went from $1.75 to $1.92. Hale & Norcross, from $2.90 to $3.80, but yesterday declined to $3.05. Ophir shows only one sale at $4.25. Savage at $2.25@$2.30. Yellow Jacket advanced from $2.35 to $2.60. Alta remained $1.35. Best & Belcher showed a declining tendency, and went from $3.15 to $3.35; Bullion was firm at from $1.60 to $1.85. Chollar advanced a dollar, the last price being $4.25. Exchequer went from $1.10 to $1.80; Mexican sold at from $3.60 to $3.80: Utah sold at $1, assessment paid, and at from 70c. to 85c. assessment unpaid.

Very little is doing in the Tuscaroras. Navajo is quoted at 29c.; Belle Isle at 25c.

Comstock Tunnel stock sold at 17 and 18 cents and the bonds at $27.

Caledonia was firm at $2; the company has declared a dividend of 8 cents, payable on the 15th inst. It is rumored the dividends will be monthly hereafter. Iron Hill showed one sale last Saturday at 52 cents; the other Black Hills stocks are neglected.

Horn Silver this week advanced to $2.40, and from present appearances, as already stated in this column, it appears as if the stock will go still higher. Ontario continues to be firm at $41.50.

There is very little doing in the Colorado stocks, and many of the companies which heretofore were the most active on the list have entirely disappeared, yet the mining operations in Colorado are to-day being carried on more actively than ever before. Colorado Central shows one transaction at 80 cents.

Freeland continues to be the center of attraction and the business amounted to 18,800 shares at prices ranging from $1 to $1.25; Iron Silver is quoted at $1.95; Little Chief at 29c. and 30c.; Silver Cord at 40c. and 43c.; Small Hopes, one of the great mines of Leadville in days gone by, when the stock sold at $8, $9 and $10, is down to $1. There is little change to report in La Crosse, which remains from week to week at about 7 to 8 cents.

Since the Bodie stocks have begun to levy assessments they have been neglected, and Standard this week went down to 20 cents. A sale was made at 50 cents, assessment paid.

Brunswick, the stock of the reorganized company, was called for the first time on Tuesday, and has since sold at 52 and 53 cents.

Quicksilver Pref. which continues to hold its own at $36, shows a business of 200 shares. Common remains steady at $6.25 to $6.63. Plymouth Cons. has entirely disappeared from the list.

Sutter Creek is still held up by its manipulators and they brought the price this week from $1.30 to $1.50. Astoria is quoted at 5c. to 6c. Amador is neglected.

The old "chestnut" "a rise in El Cristo" is again making the rounds, but the manipulators of this stock find it not a very easy thing at present to get people to crack the chestnut for them. They would no doubt like to see the price up to $9, or even higher, but until there are some practical results there will be little chance of seeing any great advance in the price of this stock.

Rappahannock is stationary at 5 and 6 cents. Mutual Smelting & Mining remains unchanged at from $1.65 to $1.70. One sale of Kingston & Pembroke is reported at 55 cents.

Good reports from the property of the Phœnix Mining Company continue, and judging from present appearances we would not be surprised to see the price of this stock advance. At present it is quoted from 87 to 91 cents. Silver King advanced from 35 to 39 cents.

The Wall Street Mining and Milling Company is making a great attempt to court favor with specu-

lators in mining stocks, and in order to succeed, the promotors are arranging large transactions apparently on the "wash sale" plan. The price has been advanced from 58 to 75c.

The transactions in this stock alone amounted to 56,310 shares. Moulton and Alice, it seems, are not favorites in this market; the former shows a few sales at 45 cents and the latter at $1.25.

Boston. April 2.

(From our Special Correspondent.)

The market the past week has been a fairly active one and prices have been well sustained. There is a growing tendency to buy the copper stocks as affording a good margin for future profits as well as for investment, and the outlook for this class of stocks is quite as good or better than is offered in the purchase of railroad or other securities. The feature of the market has been the large dealings in Santa Fe stock, which has been thrown upon the market in large lots and, it is believed, by insiders, who are disappointed in what has been accomplished since the new management took it in charge. The mine is earning about $3,000 net per month and had a cash balance of about $11,000 on hand at the last meeting of the directors. Most of the ore is of a low grade and does not pay to smelt until concentrated. If the receipts continue as favorable as at present the obtaining of a concentrator will receive the early attention of the directors. The stock sold at 90c. early in the week and has steadily declined to 60c., at which it sold to-day. About 25,000 shares have been traded in during the past five days.

Kearsarge, in point of activity and strength, is the second feature of the market. The favorable outlook at the mine has brought in fresh orders to buy the stock, and carried the price up again to $13, with a slight reaction to-day to $12¾. Boston & Montana has been rather quiet, but very firm in price, selling at $48⅛ to $49. Gossip has it that Mr. Bigelow is to retire from the management, but it does not seem to have any effect upon the price of the stock.

Osceola regained the loss of last week, and sold up to $28½, declining to 27¾ on to-day's sales.

It is estimated that the production of this mine will average 300 tons per month, and, with copper at 14½c., would enable the company to earn a little more than $7 per share on the stock.

Calumet & Hecla advanced from $256 to $260 on very small sales. The output of the mine last week was 748 tons, which is more than any other lake mine produces in a month.

Tamarack is strong at $158@$159.

Quincy also firm at $72@$73. There has been very little trading in either of these stocks of late. Both are good investments at these prices.

Franklin dropped $1, to $14, with later sales at $14¼.

Atlantic sold up ½, to $13½.

Butte & Boston sold at $14, same as last week.

Centennial declined to $19. Both of these stocks have been weak, on inside selling by same parties who have been bearing Santa Fe stock. We believe them both to be a splendid purchase.

Allouez is very quiet at $3, and Central sold at $8, same as last week. National declined ¼, to $1½.

Balance of the market shows no change.

In silver stocks there is absolutely nothing doing. Dunkin, on the prospect of passing another dividend, declined to 55c. Breece was offered today at 37½c. Don Enrique, 30c. bid, 38c. asked.

3 P. M.—The market was strong this afternoon. Boston & Montana sold at $49. Quincy advanced $1—sales at $74. Kearsarge was in good request at $13, and Santa Fe advanced to 67½c.

To-morrow and Friday being holidays, there will be no session of the Stock Exchange until Saturday next.

Denver. April 1.

(From our Special Correspondent.)

A very beneficial change in tone and bearing of this market has taken place since the opening of the Exchange at Kansas City. It has certainly given more confidence in the permanency of the exchanges, as well as in the majority of the properties listed upon each board, than has heretofore existed. It only requires perfect co-operation of those who thoroughly believe in honest mining to make this a nucleus, around which will cluster the future Exchanges of Butte City, Salt Lake, Minneapolis, Chicago, St. Louis and Cincinnati, with those of New York, Boston and Philadelphia. The Exchange certainly deserves some credit in organizing under the shadows of past failures of such institutions throughout the country, and especially of the West. But we hope that with extra care and due consideration of the future of mines and mining, not only in Colorado, but in the whole West, we will be able to steer clear of the rocks that nearly every one of the predecessors of the Exchange were wrecked upon. A safe foundation has undoubtedly been laid. Many honest mining men are members; more are joining the association.

Fair dealing will make it win, and the proposed clearing house will materially assist in that. The outcome will be carefully watched, and we hope that success will attend these efforts, so that in a few short months we may see the Exchange installed in the new building which we are now prepared to erect. Success here means prosperity to the production of precious metals and the return of Eastern confidence, so badly needed, to develop our properties and furnish the market for our products.

Prices and sales during seven days ending March 31st.

Company	Opening.	H.	L.	Closing.	Sales
Alleghany, Colo	28	*30	28	28	10,400
Amity, Colo	15	*16	*13	14	29,100
Bangkok, C. B., Colo	26a	*27	23	23b	3,600
Bates-Hunter, Colo	23	*25	22	*23	24,700
Brownlow, Colo	41	*43	38	38b	1,100
Calliope, Colo	45b	45½	45	45	4,400
Clay County, Colo	41	*46	40	42a	8,900
Hard Money, Colo	*17	*17	14	14	95,400
Little Rule, Colo	50	*52	49	49b	6,100
Matchless, Colo		120b	110b	117b	....
May-Mazeppa, Colo	118	*121	117	122	33,500
Mollie Gibson, Colo	45b	45	45	60a	300
Oro, Colo	680b	680b	675b	675b	....
Pay Rock, Colo	08	†11	07	10	210,800
Puzzler, Colo	24	*25	‡19	25	47,400
Silver Cord, Colo	50b	50	*50	50b	700
Whale, Colo	31	*35	31	*35½b	5,400
PROSPECTS.					
Argonaut	16a	†18	15	17	25,200
Aspen Mutual, Colo	21	21	19	18	14,800
Big Indian, Colo	34a	30	25	†27	600
Big Six, Colo	20b	*22	20	21	4,800
Claudia J., Colo	09b	*16	‡08	12½	28,500
Diamond B., Colo	*17	*17	15	14	60,800
Golden Treasure, Colo	20b	*22½	20	20	3,500
Ironclad, Colo	24	*26	22	23½	47,900
John Jay, Colo		*27	20	25b	143,900
Legal Tender, Colo	*11½	*11½	10	10	36,200
Morning Glim, Colo	52	*54	45	45	4,500
Natural Gas & O. Co	18a	†25	18	†24	2,700
Potosi, Colo	33	35	30	30	18,000
Rialto, Colo	—	...	14	14½	25,500

Total for the week. $43,100

*Buyer 30. †Buyer 60. ‡Seller 60. §Seller 30. a Asked. b Bid.

Kansas City. April 2.

(From our Special Correspondent.)

Business at the Exchange continues to be active, and a number of new stocks will probably shortly be listed. Seats in the Exchange are now $200 each.

The Minnequa lead and zinc mine, which was called for the first time at the Exchange last week, is listed at $60,000, divided into 60,000 shares of $1 each. Treasury stock to the amount of 20,000 shares have been set apart to pay for development work. It is located near Joplin, Mo., and consists of four claims, all containing good mineral. There are 2,000 tons of ore on the dump worth $15 per ton. The only machinery needed to successfully work the mine is a steam hoister.

The company's officers are: W. A. Webster, president; Frank T. Wyatt, vice-president, and M. M. Heathfield, secretary.

Judge D. W. Strickland, of Aspen, Colo., was in the city last week, and when asked about the J. C. Johnson mine near Aspen, which is owned by Kansas City men, stated that it is one of the best properties in the district and has been a dividend payer for some time.

Minneapolis, April 1.

(From our Special Correspondent.)

The Minneapolis Mining and Stock Exchange has finally arranged its business matters, and has at last announced regular daily sessions, excepting Saturday. The struggle to organize an exchange in this city has been a long and desperate one. It is the aim, if possible, to make this one of the leading iron and silver exchanges of this country.

The rules of the Listing Committee are as follows: The application for listing may be accompanied by a report upon the property by a mining expert who is not a part owner. The report should be accompanied by maps showing the surface location and the underground workings. If the company is in debt, a full account of the debt with all details relating to it must be given. The Listing Committee reserves the right to call for additional information at any time. All applications to list property must be addressed to the secretary and be accompanied by a fee of $25.00, which will be returned to the applicant if the application is refused.

The officers of the Exchange are: John Paulson, president; Rufus L. Pratt, vice-president; J. Russell Jones, secretary, and Howard A. Turner, treasurer.

Company.	Bid.	Asked.
Black Hills Tin M. Co	—	1.00
Bessemer Consol. I. M. Co	—	1.00
Central Iron M. Co	—	.25
Dot Iron M. Co	1.00	1.25
Gogebic Iron Co	—	12.00
York Iron Works	—	40 00
N. W. Coal M. Co	—	2.00
Old Veteran G. & S. Co	—	.50
Silver & Copper Isld. M. Co	—	.25
Thunder Bay G. & S. M Co	—	1.00
United Iron & Land Syndicate	—	6.30

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

Gold Stocks.—There has been no change in prices of these stocks during the past week, although there still continues to be a good demand for them. At the Michigan mine, they have just completed a mill-run of 50 tons of Gold Lake quartz. This property adjoins the Michigan on the west, and the Michigan vein extends across it. The rock was taken from several parts of the vein, from surface of the vein, the shaft, the east and west drifts and crosscut on second level, none of the very rich gold rock from recent find being milled. The average yield of this common vein rock was found to be $15.25 in bullion and $5 in concentrates. This shows the value of the quartz on the Gold Lake part of the vein to be about the same as on the Michigan. The Ropes Gold and Silver Company have recently purchased the Huntington mill. There is nothing new or important in regard to the other gold mines. On the dissapearance of the snow, which ought to be all gone in the next thirty days, active work will be under way all along the line.

Iron Stocks.—Trading has been dull, for the reason that the stocks of the best companies are not to be had, though much sought after. One reason for this is that the Lake Superior iron mining companies are generally close corporations, refusing to give out information as to their earnings, dividends, etc., claiming they are organized for carrying on private business, that it is a matter entirely between their stockholders and the companies, and which the outside public has no interest in. As a reason showing why the lucky stockholders of our Lake Superior iron mines are not anxious to sell their stocks, I will state a few items in regard to one of our iron mines. The Pittsburg and Lake Angeline Iron Company is situated right in the city of Ishpeming, and some eight or nine years ago was considered of little value or promise, but by the discovery of a new body of ore some two or three hundred feet west of the old Pitts. The mine has developed into a regular bonanza for its owners. The mine has a capital of $500,000, divided into 20,000 shares of a par value of $25 each. This company has paid in dividends since January 1st, 1889, to March 25th, 1890, about 15 months, $35.50 per share, or a total of $710,000. This is nearly double the dividends paid by the Calumet & Hecla, which, in the best years, only pays $20 per share and some years less. The present value of Pittsburg & Lake Angeline stock, $175 to $180 (none of it to be had); Calumet & Hecla, $260. This will give some idea of the value and profits of Lake Superior iron mining, and this is by no means the only good iron mine we have.

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mg. Co	....	....	$1.00
Grayling Gold & Silver Co	$25.00	....	1.00
Michigan Gold Co	25.00	$2.50	3.50
Peninsula Gold & Silver Co	25.00	....	.75
Ropes Gold & Silver Co	25.00	2.25	2.75

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co	$25.00	$55.00	$65.00
Aurora Iron Co	25.00	7.50	8.00
Champion Iron Co	25 00	$106.00	108.00
Chandler Iron Co	25.00	40.00	41.00
Chapin Iron Mining Co	25.00	30.00	33.00
Chicago & Minn. Ore Co	100.00	115.00	120 00
Cleveland Iron Co	25.00	18.50	19.25
Germania	25.00	11.50	12.50
Jackson Iron Co	25 00	120.00	125.00
Lake Superior Iron Co	25 00	67.00	68.50
Milwaukee Iron Co	25.00	6.50	7.50
Minnesota Iron Co	100.00	83.50	85.00
Montreal Iron Co	25.00	9.00	10.50
Norrie (Metropolitan)	25.00	75.00	80.00
Odanah Iron Co	25.00	20.00	22 00
Pittsburg Lake Angeline Co	25.00	170.00	175.00
Republic Iron Co	25.00	48.50	49.00

PIPE LINE CERTIFICATES.

(Specially Reported by Messrs. WATSON & GIBSON.)

The petroleum market has been very weak, and selling as low as 79¾ on Wednesday. The market is very narrow, but the sentiment is bearish, and the monthly report of receipts and deliveries in the oil regions for March may possibly show an increase in visible supply. If so, it will be the first time in nearly two years. The expectation of further development in West Virginia, and of an increased output from the Pennsylvania wells, deters buyers, to say nothing of Russia, which is expected to supply Europe with more oil this year than ever before, and Ohio, where the product of the Lima wells is now said to be utilized for illuminating oil. Petroleum, however, is a very cheap commodity at ruling prices, and upon any serious break we should recommend it as a purchase.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 29	84¾	85	84¾	85	39,000
31	84⅞	84⅞	84	84	46,000
April 1	84¾	84¾	82	82	167,000
2	81	82¾	80½	82⅛	202,000
3	82¼	82⅝	80⅝	80⅝	188,000
*4					
Total sales in barrels					642,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 29	85	85⅝	84⅞	85	22,000
31	84½	85¾	84⅜	84⅜	149,000
April 1	84	84⅞	81½	81¾	240,000
2	81⅝	82⅞	79⅞	82¼	384,000
3	82⅝	82⅝	81	81⅝	184,000
*4					
Total sales in barrels					943,000

* Good Friday.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, April 4.

Statistics.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending March 29, 1890, compared with the same period last year:

Regions.	March 29 1890.	March 30 1889.	Difference.	
Wyoming Region Tons	258,258	266,087	Dec.	7,829
Lehigh Region ... "	100,529	90,579	Inc.	9,950
Schuylkill Region. "	148,262	177,535	Dec.	29,273
Total.....	507,049	534,201	Dec.	27,152
Total for year to date..	6,155,222	6,823,254	Dec.	668,032

PRODUCTION OF BITUMINOUS COAL for week ending March 29th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2,240 lbs.	1890. Week.	1890. Year.	1889. Year.
Phila. & Erie R.R.....	1,221	32,569	23,486
Cumberland, Md.....	66,401	912,252	699,528
Barclay, Pa.....	3,263	34,373	32,003
Broad Top, Pa.....	9,836	136,986	106,071
Clearfield, Pa.....	76,982	1,013,889	748,292
Allegheny, Pa.....	21,222	371,273	255,517
Beach Creek, Pa.....	41,373	465,961	350,883
Pocahontas Flat Top.....	34,146	430,824	372,807
Kanawha, W. Va.....	45,197	489,603	417,480
Total.....	299,741	3,887,730	3,006,066

WESTERN SHIPMENTS.

Pittsburg, Pa	17,808	223,806	182,958
Westmoreland, Pa.....	35,145	458,185	375,060
Monongahela, Pa.....	3,930	49,568	70,560
Total.....	56,883	731,559	628,578
Grand total.....	356,624	4,619,289	3,634,644

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending March 29th, and year from January 1st, in tons of 2,000 lbs.: Week, 114,039 tons; year, 1,405,648 tons; to corresponding date in 1889, 1,122,423.

Anthracite.

During the past week the condition of the anthracite coal trade has improved considerably, and many of the companies report quite a large business doing, though at very low prices. We can see no prospects for an immediate advance in prices, though the consumption, stimulated by the exceedingly low prices now ruling, will undoubtedly increase, and with the demand and supply more evenly balanced prices will improve; but this can only take place gradually. It is a very simple matter to point out that there is too much coal being mined for the present requirements of the trade, but how to remedy this apparent evil is a very difficult problem to solve. By restricting the output the companies are taking a step in the right direction, and within a short time the beneficial results will be noticeable.

Since the beginning of the year the trade has been settling down to a lower and more solid basis, and as the unusual conditions with which it has had to contend are fast passing away, the future to the anthracite coal men now looks brighter than it has for some time past. Good free burning coals can be readily obtained at the following prices: Broken, $3.40; stove and egg, $3.50; chestnut, $3.25, and pea and buckwheat, $2.80 and $2.20 respectively.

The New York Retail Coal Trade.

A special meeting of the Retail Coal Exchange was held Tuesday afternoon. The meeting was well attended, and, after some debating, it was decided to reduce the retail price of coal in this city 25c. per ton from this time forward.

Bituminous.

The bituminous coal trade continues to be in sympathy with the anthracite. Prices are, if anything, a shade lower, and there is plenty of coal to be had. Several large orders are now pending which have created some very sharp bidding, and it is expected they will be closed this week at pretty low figures. Most of the railroads are moving coal with unusual dispatch, and there is no lack of shipping facilities. Coastwise freights are a little off, and we may quote Baltimore to Boston at $1.15; to Providence, $1; Philadelphia to Boston, 95c., with some of the companies holding back at 90c.

On the 2d inst. the miners in the Westmoreland region demanded an increase of 15 cents per ton, and awaiting the decision of the producers, have suspended work. It is not believed, however, that the demand will be granted.

In the West the producers have so far been unsuccessful in their efforts to obtain a reduction in railroad rates. At the meeting in Columbus nothing was done.

Buffalo. Arpril 3, 1890.

[From our Special Correspondent.]

The coal merchants and retail dealers have nothing to say. They may be great thinkers nevertheless. Your correspondent has but little to report, and will commence by saying that both the anthracite and bituminous coal trade is dull, with prices unchanged, and end by jotting down a few brief items of interest which have occurred or are on the eve of occurring.

Navigation on Lake Erie has reopened, if it can be said that it has closed since last fall. Vessels could have entered and cleared on every day this year.

The Welland Canal, Canada, will open April 15th.

The Erie Canal will not be ready for navigation until May 1st, at the earliest.

The Straits of Mackinaw are still closed by ice. "Old Probabilities" thinks that he may venture a prediction that they will open from 10th to 15th of this month.

Several charters have been made for coal from Buffalo to Chicago at 50 cents per net ton. Shippers say that they are not anxious for tonnage, as Chicago imposes a tax of 10 cents per ton on all coal on the docks May 1st.

The first vessel to arrive at this port this season was the propeller "Dean Richmond," from Toledo, laden with corn, on Tuesday last, March 31st, at 7 o'clock P. M. There was no obstruction whatever by ice, the captain reporting a good run down. The "Richmond" left for Toledo yesterday.

During the late storm the schooner W. J. Suftel, laden with 500 tons of coal from Charlotte to Toronto, was driven ashore near Hamilton, Ont.; she has not been released as far as heard from.

Five thousand feet of new docks are being built at Tonawanda, ten miles from this port, on Niagara River. A portion of these docks will be used by Messrs. J. M. Drill & Co., coal dealers of this city and Tonawanda, for coaling and storage purposes.

In consequence of the death of Mr. Howard M. Smith, the firm with which he was connected has reorganized under the name of "Bartlett & Sears," coal merchants and forwarders.

Newspaper paragraphs from all directions show that there is great activity among car builders to fill their orders for coal and other freight cars.

The meeting to adjust coal rates of freight between the Pittsburg and Hocking Valley fields was not held at Cleveland last Saturday. It will probably take place in Pittsburg at an early day next week.

The Buffalo Merchants' Exchange report for 1889, containing Mr. William Thurstone's coal statistics of that port, was published last week. Send for a copy.

A dispatch just received from Mackinaw last night says: "The hot sun and strong west wind of to-day have changed the condition of the ice considerably, and should it continue so for a week longer there would be a possibility of boats getting through the straits by the 10th. There are several open places in the ice this evening caused by the wind."

The schooner loads here for Toledo to-day with coal at 30c. freight.

Chicago. April 2.

[From Our Special Correspondent.]

In this market the conditions noted last week remain unchanged. The regular monthly meeting of the Chicago Coal Exchange, March 28th, adjourned without a quorum. There are no new features to report in connection with this industry whatever. It is expected that the associated anthracite companies will unite in a few days upon a price with which to open the season's trade. Meantime we continue to quote the all-round price for anthracite at retail, at $5.75 and $6 per ton.

Large and small egg we continue to quote at $4, range and chestnut at $4.75 on dock; on wheels, 25c. additional.

Pittsburg. April 3.

(From our Special Correspondent.)

Coal.—The market, generally speaking, has undergone little change. The mines are running full up to this time. A shut down of a portion of the mines may take place at any time. March shipments Ohio River, Cincinnati, 3,184,000 bushels; Louisville, 7,110,000. Total, 10,294,000 bushels.

The nominal prices are:

Per 100 bushels.		Per 100 bushels.	
1st pool.....	$4.75	3d pool.....	$3.90
2d pool.....	4.50	4th pool ...	3.25

Railroad coal, $5.00@$5.50.

Connellsville Coke.—The situation remains about the same in the Connellsville district, the outlook being all that could be desired. There is an ample supply of cars. Some of the works are running six days instead of five; the large works of the Frick and McClure's works will run five days. The number of idle ovens is about 675; active ones, 14,000. Week's shipment, 7,125 cars; increase, 505 cars over previous week. Shipments west of Pittsburg, 4,075; Pittsburg and rivers, 1,540 cars; east of Connellsville, 1,620, aggregating 7,235 cars; production, 125,220 tons.

Current rates: Furnace f.o.b. on cars at works $2.15; Foundries, $2.45; Crushed, $2.65. Freights show no change. Pittsburg 70c.; Mahoney and Shenango Valley, $1.35; St. Louis, $3.05; Chicago, $2.75; Cleveland, $1.70; Cincinnati, $2.65; Louisville, $3.20.

FREIGHTS.

From Baltimore to: Boston, Mass., 1.10@1.15; Brooklyn, 1.05; Charleston, 80; Fall River, 1.10; Galveston, 3.00; New Bedford, 1.05@1.10; New Haven, 1.05@1.10; New York, N. Y., 1.05; Norfolk, Va., .60; Portland, 1.10@1.15; Portsmouth, N. H., 1.15; Providence, 1.05@1.10; Quincy, 1.10@1.15; Salem, Mass., 1.10@1.15; Savannah, 90; Williamsburg, N. Y., 1.05.

From New York to: Bangor, †65; Bath, Me., †70; Boston, †65; Bridgeport, †50; Cambridgeport, †75; Gardner, 75; Gloucester, 75; New Haven, 50; Salem, 65.

* And discharging, † Alongside, ‡ And towage.

METAL MARKET.

NEW YORK, Friday Evening, April 4.

The New York Metal Exchange, though a very useful institution, has not been very successful. For some reason or other none of the numerous metal exchanges organized here have attained that degree of success which the importance of the metal trade of this city would seem to justify. We do not now propose to discuss the reasons for this partial or total failure, but merely say that there should be a policy that would commend itself to the members of the trade and that would make such an institution absolutely indispensable.

It is now proposed to either liquidate the Metal Exchange and distribute its assets among its members or buy a building and endeavor to revive interest in it. We sincerely trust that the Exchange will not be abandoned, but, on the contrary, let some energetic effort be made to inject new life and enterprise into this useful, though apparently dormant body. The able secretary of the Metal Exchange must have some plan in view that will effect this revivification.

Prices of silver per ounce troy.

Mar	Sterling Exch'ge	Lond'n Pence.	N. Y. Cts.	Apr	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
29	4.86¼	43⅞	95⅝	2	4.86¼	43⅞	95⅝
31	4.86¼	43⅞	95⅝	3	4.86½	43⅞	95¾
Apr 1	4.86½	43⅞	95¾	4	*	*	*

* Good Friday.

Council Bills advanced $\frac{1}{16}$ d. on Wednesday's allotment.

The silver market has been characterized by steadiness and good demand for London shipment. Sterling Exchange is also a firm feature in silver prices.

The United States Assay Office at New York reports total receipts of silver for the week to be 30,000 ounces.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount and it remains at 4 per cent. During the week the bank lost £417,000 bullion, and the proportion of its reserve to its liabilities was reduced from 46·14 to 41·23 per cent. against a decline from 41·30 to39·10 per cent. in the same week of last year, when its rate for discount was 3 per cent. The bank, on the 3d inst., lost £50,000 bullion on balance. The weekly statement of the Bank of France shows gains of 2,975,000 francs gold and 2,975,000 francs silver. The weekly statement of the Imperial Bank of Germanyshows a specie loss of 36,310,000 marks.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars.....	$ .76	$ 78
Mexican dollars.....	.74½	.76
Peruvian soles and Chilian pesos.....	Nom'al.	Nom'al.
English silver.....	4.83	4.88
Five francs.....	.94	.95
Victoria sovereigns.....	4.86	4.88
Twenty francs.....	3.86	3.90
Twenty marks.....	4.74	4.78
Spanish doubloons.....	15.55	15.70
Spanish 25 pesetas.....	4.82	4.88
Mexican doubloons.....	15.55	15.70
Mexican 20 pesos.....	19.50	19.60
Ten guilders.....	3.96	4.00
Bar silver.....	.95½	.96½

Coinage at the United States Mints.

Coinage executed at the mints of the United States during March:

Denomination.	Pieces.	Value.
Double eagles.....	91,520	$1,830,400.00
Eagles.....	20	200.00
Half-eagles.....	20	100.00
Quarter-eagles.....	30	75 00
Total gold.....	91,590	$1,830,775.00
Standard dollars.....	3,600,265	$3,600,265.00
Half-dollars.....	265	132.50
Quarter-dollars.....	265	66.25
Dimes.....	265	26.50
Total silver.....	3,601,060	$3,600,490.25
Five cents.....	1,349,425	$67,473.25
One cent.....	4,943,265	49,432.65
Total minor.....	6,292,730	$116,905.90
Total coinage.....	9,985,380	$5,548,171.15

Copper.—The tone of the copper market continues very firm, and the demand for Lake brands is remarkably heavy, as is evidenced from the fact that the stocks usually accumulated at the Lakes in anticipation of the opening of navigation in the spring do not exist this year, as almost the entire production has been immediately shipped by rail. Bids of 14¼c. for large quantities have been de-

clined by the bankers, who hold the remainder of their stocks for 14½c., which figure is almost the lowest quotation of the producing companies.

For Arizona and casting brands a very good inquiry has also existed, and the quotations for such kinds remain unchanged at 13¼@13½ for the former and 12⅝@12⅞ for the latter, according to brands.

In London the Chili Bar market was rather flat early in the week and values declined to about £47 10s. cash, from which point a reaction set in and the latest cables report prices closing firm at £48 5s. to £48 7s. 6d. spot, and £48 12s. 6d. to £48 15s., three months.

In Europe refined and manufactured sorts continue quite steady, without any alteration in the quotations reported last week.

The statistics of visible supplies gave no change for the second half of March, but the whole month of March showed a decrease of 3,000 tons.

A verdict for 1,018,400 francs damages and the costs of the action has been returned in Paris in the suit of Gibbs & Sons against the *Société des Métaux*.

The exports of copper from New York during the last week were as follows:

To Liverpool.	Copper.	Lbs.	
By S. S. Germanic.....	6 sacks.	7,500	$1,000

Tin.—Several steamers bringing supplies having arrived, and others being due, the premium lately obtainable for spot tin may now be regarded as lost. Business on the Metal Exchange has been exceedingly limited, but the current demand on the part of consumers continues fairly satisfactory. We quote spot at 20·25, 20·35, April at 20¼, May at 20¼, June at 20¼.

During the week the London market has ruled very steady, and the last quotations there are £90 7s. 6d. to £90 10s. spot, and £91 5s. to £91 7s. 6d, three months. The statistics of visible supplies showed a decrease of 700 tons for the month of March, which was rather a surprise and must influence prices later on.

Lead has been very flat, and we have again to reduce quotations to 3·90. It has become known that some of the lead held in store for some months past, and which has been the subject of litigation, has now been released, and several hundred tons of this metal having come on the market, this, no doubt, caused the present depression. Otherwise the weakness was not warranted, as the Western consumers are absorbing very large quantities, and the production during the last three months has been decidedly smaller than the average.

The London quotations are £12 10s. for Spanish and £12 15s. for English lead.

The St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: Lead is quiet. Transactions have been few and far between since our last report. Offerings are apparently quite light. Consumers, being reasonably supplied, feel quite easy on the situation, and show a slight unwillingness to pay the prices asked, which are 3·70 for common and 3·75 for argentiferous.

The Chicago Market.—Messrs. Everett & Post telegraph us as follows: Since our last report this market has been very dull, with sales of single cars here and there, at 3·80c. A lot of 100 tons sold early in the week at 3·75c., which is the quotation at the close for common lead. Corroding lead is held higher at 3·80@3·85c.

Spelter is dull and neglected and the quotation for prime Western must be reduced again to $5.05@$5.10 New York.

The European markets are also weaker, and the latest quotations in London are: Ordinaries £21, and specials £21 6s.

Antimony remains very scarce, with a good demand. As hardly anything remains on spot, higher prices have again been willingly paid by consumers. We quote: Hallett's, 19@19¼c., and Cookson's, 26@27c.

Nickel—This metal is quoted at 70@75c., according to quantity.

Quicksilver.—Nothing of importance has transpired. We continue to quote $49.50 in New York, and £9 10s. London.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 4.

Pig Iron.—There have been the usual rumors afloat here as in Philadelphia of offers of Southern iron at very low figures, but leading firms generally say that they are unaware of any particularly low prices.

On the other hand some dealers in standard Northern brands emphatically state that they will not accept lower prices than those they have been quoting for some time past, $20 for No. 1 X and $19 for No. 2 X. There is no doubt that good iron can be bought far below these prices, and that Pennsylvania iron men generally are willing to accept current figures. A wide range in quotations undoubtedly exists to-day, those whose necessities are pressing being willing to accept low prices, while those whose order books are well filled hold for high rates. This may be seen by the following quotations, which we have obtained from several prominent dealers: For Northern iron, No. 1 X, $18.50@$20; No. 2 X, $17.50@$19. Southern brands, No. 1 X, $17.50@$18; and No. 2 X, $17@$17.50. The higher figures are for the most part nearly nominal.

The present consumption of pig iron is very large, and it is only the exceedingly heavy buying during the fall months that has enabled consumers to keep out of the markets, and thus far do a hand-to-mouth business.

Dealers agree with remarkable unanimity that bottom prices will be reached between now and the 1st of June, after which they look for a good market. While the general features of the trade continue pretty much as reported for two months past, there are indications which encourage the hopeful. The low prices at which Southern iron has undoubtedly been sold have so small a margin of profit it would seem as if there was little room for much of a decline—$16.50 to $17 for No. 1 Southern foundry iron, and $16@$16.50 for No. 2, after deducting, say, $4.25 freights, leaves but a very small profit to the furnace. Northern irons have still a little leeway, but the cost of production in the north has been increased more than in the south; this is especially true of furnaces using Lake ores, the price of which is very high.

Scotch Pig.—This week has wrought no change in the dullness of Scotch pig iron. We note small sales of Dalmellington at $22.50 and Coltness at $25.50.

Steel Rails.—No sales of any magnitude are reported, and the market for steel rails is weaker. Quotations are nominally $34@$34.50, and rails can be obtained very readily at the first figure.

Spiegeleisen and Ferromanganese.—Are quiet with not much business. The former has been quoted at $33.50@$34, but buyers are unwilling to pay these prices, and dealers seem equally loth to dispose of their stock. Ferromanganese continues quiet at $82.50 for forward delivery, and $90 for early delivery.

Merchant Steel.—We note some improvement in merchant steel as to volume of business, and but little as to prices. We quote: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.

Rail Fastenings.—The market continues exceedingly dull. We give quotations which are nominal. There is but little doubt that buyers could obtain more satisfactory prices. Spikes, 2·25c., angle fish-plates, 2·15@2·25c.; bolts and square nuts, 3c.; hex nut, 3·25c.

Tubes and Pipes.—There has been no change either in business or in prices. We continue to quote as follows: The ruling discounts on car lots are 47½ per cent. on small black, 40 on galvanized, 60 on large orders of black and 47½ on large lots of galvanized; 45 on 1¾-inch boilers, 50 for 2 to 4-inch and 52½ on larger than 4-inch; casings all sizes, 50 per cent.

Old Material.—The market is very dull, and no actual quotations can be given:

Chicago. April 2.

(From our Special Correspondent.)

Pig Iron.—There seems to be a lack of confidence in the market. Consumers are acting upon the hand-to-mouth system, and will continue to do so until the market become more steady. The late falling off in prices is somewhat checked for the present. The volume of business during the past week has been small, but that in sight, and inquiries large. Little business in proportion to the talk. Inquiry is not demand, but indications point in the direction of large purchases in the near future. Charcoal irons have fallen off slightly; coke irons more, owing to the great drop in Southern pig. It is purely a matter of conjecture which way the market will turn; consequently, buyers are holding off for the present. We quote to-day for cash per ton of 2,240 pounds, for delivery on cars or boat here: Lake Superior charcoal, Nos. 1 and 2; Lake Superior for car wheels, No. 3. and Lake Superior for malleable, Nos. 4 and 5, $22.

No. 1 Lake Superior coke, Bay View, $18.50; No. 2 do., $17.50, and No. 3 do., $16.50@$17.

No. 1 Scotch, according to brands, $26@$27; No. 1 American Scotch, Ohio blackbands, $21.50@$22; American Scotch, Milwaukee, $19.50; No. 1 Silvery Milwaukee, $20@$21; No. 1 Silvery, Jackson county, $19.25@$19.50; Ohio softeners, $19@$20; No. 2 do., $18@$19; cold blast charcoal for car wheels, $28@$30; No. 1 Southern coke, $17@$17.50; No. 2 do., $16.50@$17; No. 3 do., $16@$16.50@$18; gray forge, $15.50; Tennessee charcoal, No. 1, $19@$20. No. 2 do. $18.50@$19.50; Alabama Car Wheel, $24@$25; Bessemer, $21.50; Hamilton No. 1, $20.50; Norton No. 1, $19; Zanesville No. 1, $20.50. Ohio irons are firmer than any iron in this market. Southern and local irons are very weak.

Bar Iron.—The market is fairly active and the demand good. $1.70@$1.80 is quoted for half extras at mill; for muck bar quality, $1.75; old rail quality, $1.70.

Sheet Iron.—Dealers are expecting a good demand at satisfactory prices as soon as the season is fairly opened. No change is noted in figures, and we quote as follows: For No. 27 3·10c.; No. 10 to 14 heavy, 2·90c.; No. 16, 3c.; No. 18, 2·25c.; No. 10 to 14 steel sheets, 3@3·25c.; No. 16, 3·50@3·75c.; No. 18, 3·75@4c.

Old Wheels and Rails.—Prices are somewhat firmer, but the market is dull and the demand light. Old wheels range from $20@$20.50; old iron rails, $23.50@$24.

Nails.—Steel nails at mill are quoted at $2.15@$2.20 f.o.b., Chicago. Some heavy stocks are held, and holders have broken prices somewhat, but the mills are firm. At the beginning of the season it would seem that other than natural causes would cause any depreciation in this market.

Plates, Tubes, etc.—The stores are doing a good business. Prices remain firm and unchanged in small lots. We continue to quote as follows: Tank iron, 2·75@2·80c.; tank steel, 3@3.10c.; she iron and steel, 3·25c.; flange steel, 3·50c.; fire-box, 4·25@5·50c.; boiler rivets, 4@4·25c.; Norway rivets, 40 per cent.; boiler tubes, 1¾ inches and less, 45 per cent.; 2 to 4 inches, 50 per cent.; 4 inches and over, 52½ per cent. Tank iron, carload lots, 2·55@2·60c.; tank steel, 2·70c.; sheets, 10 to 14, 2·60@2·70c.; steel sheets, 2·80@2·90c.

Structural Iron.—As the season advances and with the World's Fair in view, business present and prospective is looming up, the air is filled with rumors of new buildings contemplated. Great activity pervades this market and inquiry is assuming large proportions, and it is to be hoped that the present unsettled condition as to some of the branches of skilled labor may become adjusted at an early day. Prices remain unchanged. We quote for car lot f. o. b. Chicago: Angles iron and steel, $2.45@$2.60; mineral plates, $2.65; sheared plates, $2.80; tees, $2.90@$3; beams and channels, $3.20.

Merchant Steel.—A good demand and the following figures well maintained for tool steel: $7.75@$8; specials, $12@$25; open hearth machinery, $3; Bessemer machinery, $2.50@$2.60; open hearth spring steel, $2.60@$2.65; tin, $2.50@$2.60; toe calk, $2.70@$2.80; crucible sheet steel, $7@$10; crucible spring, $3.75.

Sheet or Bolt Copper, 22c. pound rates.

Sheet Brass, Copper and Brass Wire, 30 per cent. discount, factory delivery.

Louisville. April 1.

(Special report by HALL BROS. & CO.)

The market has not aroused from the lethargic condition that has characterized it for some weeks, and there have been no sales worthy of mention. The disposition is a waiting one, and there are no real fixed prices. Several of the large local foundries were badly damaged by the tornado, and among them no buying is expected for some time. Work of repairing and reconstruction is being vigorously pushed, and some will be working all right again probably within a week. In the interim, however, deliveries of iron to some extent will be suspended.

Hot Blast Foundry Irons.		
Southern Coke	No. 1	$16.00@$16.25.
" "	No. 2	15.00@ 15.50.
" "	No. 3	14.50@ 15.00.
Mahoning Valley, Lake ore mixture		18.00@ 19.00.
Southern Charcoal	No. 1	17.50@ 18.00.
" "	No. 2	17.00@ 17.50.
Missouri "	No. 1	18.50@ 19.00.
" "	No. 2	18.00@ 18.50.
Forge Irons.		
Neutral Coke		14.00@ 14.50.
Cold Short		14.00@ 15.00.
Mottled		13.50@ 14.00.
Car Wheel and Malleable Irons.		
Southern (standard brands)		22.50@ 23.00.
" (other brands)		19.00@ 20.00.
Lake Superior		22.50@ 23.00.

Philadelphia. Apr

(From our Special Correspondent.)

Pig Iron.—The Eastern Pennsylvania pig iron market is in a most unsatisfactory condition. The only evidence of improvement is an increase in orders for forge iron. A good many inquiries have been made for foundry within the past two days, but the transactions are insignificant. Consumption continues heavy, but buyers, instead of covering the requirements for the summer, are covering only for a few weeks. A feeling of expectancy pervades the entire market. Outside irons are being looked after, and offers of Southern forge were received here yesterday at $15.50, at which business will be done before Saturday. Brokers representing Pennsylvania concerns are a little apprehensive of Southern iron rushing in at this or similar figures. Good Pennsylvania forge brings $17, although several lots of fair iron have sold at 25 and 50c. less. No. 2 is bringing $17.50; best, $18. No. 1 is worth $19 for standard, and $19.50 for special brands. A fair demand is in sight. Local authorities do not think the business in Southern iron will amount to much. Several buyers have been in the market asking for Bessemer, and the best quotation given is $20. Large orders are about being placed.

Foreign Material.—Buyers are refusing to pay over $34 for 20 per cent. spiegel; asking prices are 50c. higher; a large amount of business is expected during the coming three or four weeks. Ferromanganese is quoted at $85 to $90.

Billets and Slabs.—Prices have declined still farther. Brokers representing manufacturers are

very reticent as to the bottom figures at which two or three large transactions have been closed. Manufacturers have refused $30.50, but it is claimed that large lots are to be placed at that figure, delivered. Small lots have sold at $32 this week. There are a good many inquiries in hand, and parties on the inside say that large sales will be made in a few days, as a good many customers are under the necessity of renewing contracts. Slabs are extremely dull, and, in fact, practically unsalable at present.

Blooms.—Sales of charcoal blooms were made this week at $54.50, and of anthracite at $44.50. Scrap blooms sold yesterday at $36.

Muck Bars.—Prices are still declining, and quotations to-day range from $29.50 to $30.50. An offer is in hand at $28.75. An active demand is looked for by every maker and broker connected with the trade.

Manufactured Iron.—Manufactured iron is in better demand than for some weeks, but only at the very bottom prices which the recent depression has brought about. Manufacturers say there will soon be an advance of one-tenth, but this is doubtful. The large buyers are now negotiating for supplies to see them through the summer, and the advance, if made, will be obtained only from the small hand-to-mouth buyers. It is rather difficult at present to obtain 1·95 for refined iron, more selling at 1·85@1·90.

Sheet Iron.—All the mills are crowded with work, and the stores are meeting with a good retail demand. Prices are firm. Sales of galvanized have been particularly heavy since Monday.

Skelp Iron.—The output of the skelp mills has been sold ahead for some weeks. Quotations are 1·85 and 2·05c., respectively, for grooved and sheared.

Nails.—The efforts of makers of inferior nails to unload large lots are weakening prices. Standard nails are now quoted at $2@$2.05. A heavy demand is assured.

Wrought-Iron Pipes and Tubes.—All the mills are busy, and quotations are firmly maintained. It has been resolved to continue present discounts.

Plate and Tank Iron.—The plate-iron manufacturers report demand quiet, but deny that there is any weakness in prices. It is safe to say, however, that two or three large transactions have been recently closed at less than published quotations. A large business is in sight, and all the mills are busy.

Structural Iron.—The general conditions of the shaped iron trade remain unchanged. The mills are all busy, and business prospects are excellent. Bridge builders have a large amount of contract work on hand, which they will cover probably within the next two weeks, and certainly by May 1st. A slight shading in prices has created a little flurry among structural iron makers and buyers. Universal plates are quoted at 2·25; bridge plates, 2·20; angles, 2·20; tees, 2·70; beams, 3·10.

Steel Rails.—Steel rail quotations to-day are $34@$34.50. Business for the past week, so far as reports go, 12,000 tons. The large buyers are still holding back; every day or two brings out some fresh rumor concerning a large transaction, which is seldom verified.

Old Rails.—Old rails are quoted at $25; there is very little stock on hand; interior buyers are not inclined to purchase.

Scrap Iron.—The scrap dealers are filling up their yards at quite a drop from the prices ruling last fall and during the early winter. They are now seeking buyers, and with the usual result. Prices have declined $1.50 within six weeks. To-day, good No. 1 wrought was offered at $22.50, although some makers are refusing to sell at less than $23.50. No. 1 machinery scrap is quoted at $17; old fish plates, $27.

Pittsburg. April 3.

(From our Special Correspondent).

Raw Iron.—The week past has developed nothing either new or important.

In regard to this important branch of trade, both sides continue firm in their views—the buyer, that prices have not touched the lowest point, and will still go lower. The seller, on the other hand, has an entirely different opinion, furnishing the names of Pittsburg furnaces that will make no concessions, and refuse to accept prices for their iron that outside lots can be obtained for. Under these circumstances sales reported show an extensive wide range of values. This being moving week, business to a certain extent was neglected; without exception all report trade dull; both sides seem to be waiting for something to turn up; how long they will have to wait is what no person can find out. It would be pretty safe to predict that the turning point can't be far off. The iron now being made and consumed was made from ore that cost $1 per ton less, and coke 40c. per ton less than these articles can now be obtained for, to say nothing about the increased cost of labor. These items will play a very important part in regard to the iron market in the near future. Within a day or two there was an improving demand for pigs and foundry iron; but buyers show a degree of apprehension that is rather surprising to makers, in view of the heavy consumption of iron that is assured this season. Dealers who ought to know, are firm in the opinion that activity will be a leading feature of the market onor before the first of May; by that time consumers are expected to be on hand, covering requirements that have been delayed in order to purchase at the lowest rates. The trouble with a certain class of buyers is that by the time they are convinced prices will be on the up grade, it is easier to see where the bottom was than where it is now. It may be regarded as a safe assertion, however, that of the coming month does not develop an advancing tendency, the chances for anything lower than present quotations are exceedingly small. Without giving unreserved endorsement to the general opinion in the trade that we are on the eve of a decided reaction towards higher prices, it must be conceded that there are many indications that give force to such ideas. Stocks have not accumulated to any extent, so that a few days of good buying would easily change the appearance of things, and such buying would soon be a matter if not of choice, of necessity. Hence the possibilities are favorable for an early improvement.

Coal and Coke Smelted Lake Ore.

1,500 Tons Bessemer	18.75 cash.
1,500 Tons Bessemer	18.85 cash.
1,500 Tons No. 1 Mill Extra at Furnace	17.00 cash.
1,000 Tons Bessemer City Furnace	19.25 cash.
1,000 Tons Bessemer	18.00 cash.
1,500 Tons Bessemer	18.00 cash.
500 Tons No. 1 Mill	17.25 cash.
500 Tons No. 2 Foundry	17.00 cash.
500 Tons Bessemer	19.10 cash.
500 Tons Bessemer	19.25 cash.
100 Tons No. 2 Foundry	17.50 cash.
150 Tons Bessemer Low Phos	26.00 cash.

Coal, Native Ore.

500 Tons Gray Forge	16.50 cash.
100 Tons No. 2 Foundry	17.25 cash.
50 Tons Silvery	18.00 cash.
50 Tons Silvery Extra	20.00 cash.
50 Tons No. 2 Foundry All Ore	18.50 cash.
50 Tons No. 1 Foundry	18.25 cash.

Charcoal.

100 Tons Off Foundry	20.00 cash.
50 Tons No. 3 Foundry	21.50 cash.
50 Tons Cold Blast	29.25 cash.
50 Tons No. 2 Foundry	22.25 cash.

Muck Bar.

1,000 Tons Neutral	28.00 cash.
500 Tons Neutral	28.50 cash.
500 Tons Neutral April	28.50 cash.
300 Tons Neutral	28.00 cash.

Steel Slabs and Billets.

500 Tons Billets	31.00 cash.
500 Tons Billets	28.75 cash.
500 Tons Billets and Slabs	29.00 cash.
500 Tons Billets and Slabs	28.75 cash.
300 Tons Billets	30.40 cash.

Steel Wire Rods.

500 Tons American Fives	43.00 cash.

Bloom Ends.

500 Tons Bloom Ends	23.50 cash.
200 Tons Bloom Ends	24.00 cash.

New Steel Rails.

7,000 Tons New Rails	35.00 cash.

Ferro-Manganese.

100 Tons 80 per cent., Pittsburgh	95.00 cash.
50 Tons 80 per cent., Seaboard	88.50 cash.

Skelp Iron.

500 Tons Sheared Iron	207½ 4 mos.
300 Tons Narrow ground	172½ 4 mos.
150 Tons Wide Ground	182½ 4 mos.

Old Iron and Steel Rails.

600 Tons American Ts	24.50 cash.
375 Tons Old Steel Rails	22.00 cash.

Scrap Material.

300 Tons Iron Axles, net	29.00 cash.
250 Tons No. 1 W. Scrap, net	22.50 cash.
200 Tons Crucible Steel, net	30.00 cash.
150 Tons Daft Steel, net	24.00 cash.

Prices.

Coke or Bituminous Pig—		20% Spiegel at Pittsburg	$35.00@36.00
Foundry No. 1	$18.25@18.50	Muck-Bar	28.50@28.75
Foundry No. 2	17.50@17.75	Steel Blooms	28.50@29.00
Gray F. No. 3	17.00@17.25	Steel Slabs	29.00@
" No. 4	16.00@16.25	Steel Cr'p Ends	23.50@24.00
White	16.00@	Steel Bl. Ends	23.50@24.00
Mottled	16.00@	Ferro-Man., 80% seaboard, May and June	85.00@88.50
Silvery	18.25@20.00	Steel Billets	29.00@
Bessemer	18.50@19.25	Old Iron Rails	24.00@25.00
Low Phos	26.00@	Old Steel Rails	22.50@23.00
Charcoal Pig—		No. 1 W. Scrap	22.50@23.00
Foundry No. 1	23.50@24.50	No. 2 W. Scrap	@18.00
Foundry No. 2	22.00@22.75	Steel Rails	34.00@35.00
Cold-Blast	25.00@29.00	" light sec	54.00@37.00
Warm-Blast	24.00@25.00	Bar Iron, nom.	1.90@ 1.95
10 + 12% Spiegel at seaboard	31.00@	Iron Nails	2.25@
		Steel Nails	2.25@
		Wire Nails	@ 2.80

CHEMICALS AND MINERALS.

New York, Friday Evening, April 4.

Heavy Chemicals.—The situation in the heavy chemical market remains unchanged. There is a scarcity of all chemicals which, moreover, is likely to continue for some time to come. It is stated that no shipments of any consequence are expected during the next ten days, and prices for delivery within that time will not be much lower than the present quotations, although the English dock men's strike is definitely ended. Some manufacturers have not yet started up, inasmuch as they dread the uncertainty prevailing among the English coal miners, who have not all resumed work. Next week may see some change, but for the present dealers, with a remarkable unanimity, declare that when prices do decline, as they probably will, they will not go down as low as they were before the difficulties commenced. Buyers are holding off in expectation of a reduction, and are doing a hand-to-mouth buying. This is, after all, the only thing possible, inasmuch as there is not enough stock here to keep them all going.

Caustic Soda—Ruling quotations are about as follows: For 60 per cent. caustic soda, 3¼@3½c.; 70 per cent., 3¼@3¾c. for 60 per cent.

Carbonated soda ash, 48 per cent., 2½@3c.; 58 per cent., 3@3¼c. for 48 per cent.

Bleaching powder, 2¼@2½c.

Sal soda, car lots for shipment, 1⅛c.; on spot, 1½c.; in small lots, 1¾c.

Caustic soda ash, 2½@3c. Five hundred tons of this were sold at 2¾c., and this practically cleaned out the market.

Bi-carbonate of soda has advanced to 2¼ in kegs, and 2¾ in barrels.

Acids.—The trade in acids continues to show a very slight improvement. Manufacturers state that, although the present condition of the trade is not better than at the corresponding period in 1889, yet, on the whole, the outlook is as good as could be reasonably expected and there is no complaint to be made.

It is asserted by those conversant with the ins and outs of the acid business that the full capacity of the works throughout the country exceeds, by 30 or 40 per cent., the consumption. Manufacturers naturally like to run their works to their utmost capacity, and the market becomes overstocked. The low prices prevailing last year were the consequence.

Among those who are not included in the Knickerbocker Chemical Company or the "acid trust," so called, the impression prevails that, despite the combination's assertions to the contrary, its policy is an aggressive one. We have been reliably informed that the company has been offering and selling 66° standard sulphuric acid in Connecticut, delivered, at 90 cents per 100 pounds. Taking into consideration the freight thither and the expense of returning the carboys, the net price of this acid must have been about 70 cents here, or a very heavy cut from schedule prices. It is said that even in this market the combination is offering acid at 85 cents. The Knickerbocker Company, appealed to, does not deny this report from Connecticut. The facts appear to be that the combination holds up to schedule figures whenever it can get them, but whenever there is a doubt about this, it "cuts" as freely and as deeply as the occasion seems to require; and wherever by cutting rates it can take away the trade of the outside manufacturers, it cuts. Of course the "trust" would like to have it believed that it is not aggressive; but the facts speak louder than words, and matters appear to be drifting rather rapidly toward the goal of all combinations which control only a moderate proportion of the production.

The following figures are stated to represent the amount of business done during six months by the members of the acid "combine," and to form the basis of the quota allowed each producer in the combination.

Martin Kalbfleisch's Sons Company (their various works), $122,110; James L. Morgan & Company (ditto), $84,108; Fairfield Chemical Company, $53,100; Highlands Chemical Company, $56,500; Dundee Chemical Company, $49,104; Lodi Chemical Works, $28,811; Phœnix Chemical Works, $18,030; Passaic Chemical Company, $7,878.

It is said that it was decided to issue stock amounting to $25,000 to provide a "fighting fund," the members to take it in the above proportions; but it was subsequently decided to assess only ten per cent. of this amount, or $2,500.

Rumor has it that 2½ per cent. of the gross earnings of the members of the combination are laid aside as a "fighting fund," from which members who have incurred losses by cutting prices shall be reimbursed.

Fertilizing Chemicals.—The trade in fertilizers, while it shows some improvement, is not very brisk, and while manufacturers are said to be exceedingly busy, dealers claim that more business would not hurt them.

On the whole prices show but little change. We quote, high grade dried blood $1.95@$2. For the low grade the price is $1.85@$1.90. Azotine, $1.95@$2. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $20@$21 per ton, and low grade, 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $18.50. Fish scrap, $21.50@$22 per ton, f.o.b. factory. Sulphate of ammonia at $3.12½@$3.15 per cwt. Concentrated tankage, $1.90@$2.00. Refuse bone-black, guaranteed 70 per cent. phosphate, $18@$19 per ton, and sales at the first figure have been reported. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock, undried, $5.75 per ton; kiln-

dried, $6.50@$7 per ton, both f. o. b. vessels at the mines. Freights by sail from Charleston to New York, $2.50@$3 per ton. Charleston rock, ground $11.50@$12, ex-vessel at New York.

Very large sales of double manure salts are reported, and stocks are light. They are in great demand among Northern farmers, especially for their powers of absorption. The sales this year thus far have been as much as the total sales during 1889. Quotations are for 48 to 51 per cent. sulphate of potash, $1.12½ per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, 2:37½ per 100 pounds. For lots on the spot, an advance over the above named figures of 2½c. per 100 pounds is quoted.

Kainit.—This article continues unchanged. Quotations are for lots for early shipments, $9.50 for invoice weight and $9.75 for actual weight. Large sales aggregating nearly 1,500 tons are reported at current figures.

Muriate of Potash.—There is a good demand for large and small lots, and the supplies are light. Three hundred tons arrived during the week, all of which went into consumption. As high as $2 has been paid for muriate on the spot, but we quote the price, first hands, as $1.70. A strike is expected among the miners, and future developments will be watched with interest.

Brimstone.—The trade in brimstone continues quite. Two thousand five hundred tons of Japan brimstone arrived by the "Forrest King," and was sold to consumers at Sicily prices. We quote best unmixed seconds on the spot, $19.25; to arrive, seconds, $19, and thirds, $18.50.

Shipments from Sicily during the month of February aggregated 11,300 tons, against 10,000 tons for the corresponding month in 1889.

Some of the sulphur recovered from alkali waste by the Chance process has been sold here and contracts for considerable amounts are under discussion. This sulphur, though now coming in as crude brimstone, is in reality refined sulphur and is subject to duty as such.

Nitrate of Soda.—We are in receipt of the following statistics, issued by Mr. F. B. Nichols, under date of the 1st inst.:

	1890.	1889.	1888.
Stocks in store and afloat in Atlantic ports, March 15, bags.	97,189	68,003	56,553
Arrivals	39,333	5,733	7,504
Previously reported, 191,824; total arrivals in date, 231,157; same time 1889, 80,603; same time in 1888, 59,673.			
Stocks	101,240	60,147	51,755

To arrive, 447,000; visible supply, 548,240; same time 1889, 378,347; same time 1888, 348,755.

Stocks with dealers in store and afloat here:

Deliveries fortnight ending April 1st	35,282	13,589	12,302
Previously reported	146,361	92,867	59,056
Total deliveries to April 1st	181,643	106,456	71,358
Sales spot	1.70 @ 1.75	2.30 @ 2⅜	2.05 @ 2.10

"A fair business was done in the fortnight, both spot and forward, at $1.70@$1.75. The European markets were not quite as strong as in the previous fortnight, although the deliveries were nearly up to expectation. At this season of the year the markets over there change with the wind; and everything that helps agriculture increases the demand for nitrate. It will not be long before its value to the farmers of this country will be made known to them. The arrivals were the 'Norris' and 'Willard Mudget,' at this port; 'H. J. Libby' at Philadelphia, and 'Magellan,' at Boston."

The English Fertilizer Market.

(Messrs. Couper, Millar & Co.'s report.)

LONDON, March 15, 1890.

Since the issue of our last circular, we have no new feature to report. Business has been restricted, mainly owing to the high prices ruling for phosphates. Manufacturers seem fairly well supplied for this season, and, as a rule, decline to contract forward, hoping to get in cheaper, of which we see no possible chance; on the contrary, high test will in all probability advance still higher, the sources of supply being so limited. Nitrate of soda comes forward in excess of demand, and price is depressed in consequence. But for this, prices of ammoniacal materials—which have ruled steady—would be higher.

Mineral Phosphates.—South Carolina inquired for, but freights keep high, and to-day's price is about 11¼d. to 11½d. per unit. Canadian also wanted, and last sale of 80 per cent. was at 1s. 4¼d. per unit, basis London; 70 to 75 per cent. held for 1s. 2d. Somme, 70 to 75 per cent., commands 1s. 3¼d., and 75 to 80 per cent. 1s. 5¼d., with rise, London terms. Belgian continues scarce, and only a little 40 to 45 per cent. and 45 to 50 per cent. offering. Curacoa and Aruba not offered. Cambridge Coprolites sold at 52s. per ton, free on rails.

Bone Ash, Bones and Meal.—Ash inquired for, but nothing offers. Bones in little request, and only one small cargo of Rosario reported sold, at about £5 8s. 9d. per ton. Bone Meal in fairly good demand, and sales reported at from £5 5s. to £5 10s. per ton.

Sulphate of Ammonia steady at £11 17s. 6d. to £12 per ton.

Nitrate of Soda dull at £8 spot for ordinary, £8 12s. 6d. refined.

Ammoniacal Materials.—Fish guano in good demand at 10s. and 1s. 3d. in buyers' bags, f. o. b. works. Ground hoofs and horns held for 10s. per unit. Dried blood, 11s. 3d. per unit.

Muriate of Potash.—We quote at £7 5s. 6d. on 80 per cent. in bags. Kainit at 28s. 3d. in bulk, f. o. b. Hamburg, in lots of not less than 50 tons; net cash; Stassfurt weights and sampling.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, April 4.

Bricks.—There is a good demand for the better qualities of brick. Complaints are not heard from brick men, and altogether there is a good market. Prices are, for best grades of Haverstraw brick, $7.25 per M: Uprivers, $6.50@$7; Jerseys, $5.25@$6; and Pales, $3.25@$3.75.

Lime.—The condition of affairs that we have reported for the past two months continues, and while the scarcity is not so great, the supply is far from being equal to the demand. Quotations are: For Rockland common, $1 per barrel; Rockland finishing, $1.20; St. John common and finishing, 90c@95c.; Glen Falls, common and finishing, 85c.@$1.11.

In our notes of the week will be found a petition from some dealers in lime.

Cement.—We learn of considerable sales of Gibbs' English Portland cement to a large smelting concern. Prices for the imported and domestic varieties are as follows: Rosendale, per barrel, 85c.@$1.10; Portland, American, per barrel, $2.15@$2.45; Portland, foreign, per barrel, $2.30@$2.40; Portland, foreign, special brands, $2.45@2.75; Roman, per barrel, $2.65@$2.85; Keene's coarse, per barrel, $4.50@$5.50; Keene's fine, per barrel, $7@$8.25.

NOTES OF THE WEEK.

Some dealers and handlers of lime in this city have circulated and signed a petition to Congress asking that the duty on lime imported from Canada be not raised. The petition states that considerable quantities of lime are now brought to the New York market from Canada, but that the most, and by far the greater part, of the lime sold in this market comes from the vicinity of Rockland, Me., and that the price of Rockland lime is controlled by a combination of manufacturers.

The only relief from this combination is the competition of Canadian manufacturers. The petitioners claim that the Rockland manufacturers are making an organized effort to induce Congress to increase the present duty on lime, which is 10 per cent. ad valorem, to such a figure that Canadian lime will be driven out of the market.

They claim that the present duty, together with the difference in freight charges, equivalent to an additional protection of about 17 per cent., is sufficient protection to the domestic manufacturer, unless it is the purpose of Congress to allow the price of an indispensable commodity to be controlled by a few domestic manufacturers acting in concert.

The petitioners also claim that the McKinley tariff bill, now in the hands of the Ways and Means Committee, will increase the present duty of 3 cents per cask to 15 cents per cask, or in other words, to increase the duty on lime 400 per cent., a movement for the benefit of a combination of manufacturers, who hope thus to obtain a practical monopoly.

On the other hand, the Rockland "trust" claims, of course, that it cannot compete with the Canada burners, and that unless it is protected by a higher duty it will be forced to suspend operations. Its claim that wages in Canada are lower than in Maine is scarcely tenable.

Parties interested in imported lime and in cement, say that they think the bill would injure the building business inasmuch as it would raise the price of good materials to such an extent that builders will prefer the poorer, but cheaper articles.

At a joint meeting of the Brick Manufacturers' Executive Committee and the Grievance Committee of the United Labor League held in Philadelphia this week, it was decided to adopt the schedule of 1889 with the exception of topping and pressed brick and sorting, which were advanced 25 cents over the schedule price of 1889.

Setting brick was also advanced 25 cents over the 1889 price, with the exception of those machine made, the price of which will be determined on by the manufacturer. The schedule went into effect the 1st instant, and will continue until December 31st, instead of November 30th, as heretofore. Before the close of the meeting William Barrett, of the United Labor League, said it was the most important meeting of employers and employés ever held in Philadelphia.

Nine hours' work and 50 cents per hour are the new terms to be enforced this year by Brooklyn Bricklayers' Union No. 9.

The encaustic and mosaic tile layers have announced that their scale of wages will be $4 per day after May 1st. No change in the hours of labor is asked.

The artificial stone masons have entered into a contract with their employers, whereby the latter agree to give the eight hour work days, beginning 15th inst.

IMPORTS AND EXPORTS OF METALS AT NEW YORK MARCH 22 TO MARCH 29 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co.		123
La Marche's Sons, H.		5
Meyer, G. A. & E.		9
Muller, Schall & Co.		93
Total		230
Corres. date, 1889		100
Pig Lead.	Lbs.	Lbs.
Caswell, E. A.		111
Hendricks Bros.		50
Schultz & Co., A.		98
Total		259
Corres. date, 1889		54
Tin.	Tons.	Tons.
Abbot, Jere, & Co.		50
Amer. Metal Co.	200	615
Bidwell & French.		145
Bruce & Cook		10
Crooks & Co., R.	10	35
Davol & Son		15
Hendricks Bros.		26
Lehmaier, S., & Co.	10	30
Muller, Schall & Co.		300
Naylor & Co.	150	475
Nissen, Geo.		10
Phelps, Dodge & Co.	50	650
Thomson, A. A. & Co.		20
Thomson, D. & Co.		10
Townsend, & Co., J. R.		30
Trotter & Co, N.		50
Total	420	2,416
Corres. date, 1889		1,840
Tin Plates.	Boxes.	Boxes.
Bruce & Cook	449	15,274
Byrne & Son		1,060
Central Stamp. Co.		23,503
Coddington & Co.	5,706	23,363
Cohn & Co	260	3,567
Con. Fruit Jar Co.		120
Cordiere F. & Co.		2,333
Cort & Co.	746	37,062
Crooks & Co.		7,873
De Milt & Co., H. R.	310	310
Dickerson, V. D. & Co	2,367	105,803
Haberman, F.		66
Herring, Chas. E.		1,000
Iron Clad Mfg. Co.		318
Lalance & G. M. Co.		2,249
Lehmaier, Schw'z & Co.		200
Merchant & Co.	65	6,143
Mersick & Co.		2,173
Morewood & Co.		26,813
Newell Bros.		257
Pratt Mfg. Co.		38,497
Phelps, Dodge & Co	56,759	129,616
Shepard & Co.		1,219
Taylor, N. & G.		234
Thomson & Co., A. A.		11,389
Warren, J. M.		1,618
Wheeler & Co.		4,388
Whittemore & Co.		3,432
Wolff & Reesing		625
Wright, Peter & Co.		227
Total	66,662	500,577
Corres. date, 1889		594,951
Pig Iron.	Tons.	Tons.
Crocker Bros.		200
Irvin, R. L. & Co.		100
Stetson & Co., G. W.	100	300
Williamson, J. & Co.		300
Total	100	900
Corres. date, 1889		6,970
Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Dana & Co		502
Downing, R. F. & Co.		5
Holt & Co., H. N.		10
Martin & Co		80
Milne, A., & Co.		16
Pope, Jas. E., Jr.		61
Roebling's Sons, J. A.	157	316
Wolff, & Co., R. H.		60
Total	157	1,040
Corres. date, 1889		8,977
Bar Iron.	Tons.	Tons.
Abbott & Co., Jere.	58	459
Bacon & Co.		536
Crocker Bros.		77
Downing & Co.	29	174
E. J. Jacobus		1
Fuller, Dana & Fitz.		11
Holt, H. N.	10	10
Lilienberg, N.	50	285
Milne & Co.		234
Muller, Schall & Co.		200
Page, Newell & Co.		687
Wilson, J. G.		2
Total	147	2,496
Corres. date, 1889		1,778
Scrap Iron.	Tons.	Tons.
Samper & Co., S.		186
Ward, J. E. & Co.		15
Total		201
Corres. date, 1889		1,103
Steel and Iron Rods.	Tons.	Tons.
Abbott & Co.	92	3,017
American S. Co.	170	395
Bacon & Co.		73
Carey & Moen.	26	166
Cooper, Hewitt & Co.		371
Downing & Co.		44
Galpin, S. A.	20	901
Greely & Co. C. S.		30
Hazard Mfg. Co.		44
Jacobus, E. Y.		2
Lee, James & Co.		244
Lundberg, G.		110
Milne & Co.		180
Muller, Schall & Co.		270
Naylor & Co.	554	2,083
Page, Newall & Co.	47	401
Roebling's Sons, J. A.		912
Schulze, P. R		1
Temple & Lockwood	6	6
Wood & Niebuhr.		25
Wolf & Co., R. H.		1,770
Total	915	9,746
Corres. date, 1889		15,243
Old Rails.	Tons.	Tons.
Frankfort, M.		2,646
Henderson Bros.		200
Hernsheim, E.		350
Sawyer, Wallace & Co.		610
Total		3,906
Corres. date, 1889		7,539
Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co.		2,725
Blakely & McLellan		1,554
Crocker Bros.	120	5,003
Dana & Co.	945	5,766
Foley, F.		50
Geisenheimer & Co.	25	227
Hernshime, L.	600	6,056
Naylor & Co.		4,32[illegible]
Perkins, C. L.		1,400
Sachs & Richmond.		2
Whittemore, H. & Co.		23
Total	1,693	25,429
Corres. date, 1889		21,605
Iron Ore.	Tons.	Tons.
Baiz, Jacob		67
Bowring & A.		222
Earnshaw, A.	218	2,250
Ennis, Andrew		438
Flores & Co., R. de		1[illegible],223
Total	218	13,200
Corres. date, 1889		3,419

EXPORTS.

Copper.	Pounds.	Pounds
Abbott & Co., Jere.		787,443
Amer. Met. Co., Lt.		734,025
Belmont, Aug. & Co.		957,315
Burgass & Co.		112,339
Heidelbech, Sichelheimer & Co.		672,608
Seamen, S. H.	66,950	66,950
Ward, J. E. & Co.		100,000
Wilms & T'hune		112,004
Total	66,950	3,560,684
Corre. date, 1889		
Copper Matte.		
American Metal Co	224,000	1,421,445
Lewisohn Bros.	244,125	907,287
Nichols, Geo. H.		267,202
Paulsen, Wm.		1,039,428
Wilms & T'hune.		2,411,917
Total	468,125	6,047,279
Corres date 1889		

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied	Date and amount of last.		Dividends. Total paid.	Date and amount of last.		
1	Adams &	Colo.	$1,500,000	150,000	$10				$555 000	Jan.	1887	10
2	Alice, s ..	Mont	10,000,000	400,000	25	*	....	....	800,000	Dec.	1889	06¼
3	Alma & Nel Wood C.	Idah	300,000	30,000	10	....	....	....	60,000	Jan.	1889	.50
4	American & Nettie, c.	Colo.	.....	300,000	....	....	....	....	150,000	Nov.	1889	10
5	Amy & Silversmith, s.	Mon.	.....	341,419	....	....	....	....	347,530	Aug.	1887	12½
6	Atlantic, c	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	620,000	Feb.	1890	1.50
7	Argenta, s.....	Nev..	10,000,000	100,000	100	335,000	July	1889	.10	40,000	Feb.	1890	.20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*	....	....	....	380,000	Mar.	1890	.10
9	Aurora, l.....	Mich	2,000,000	100,000	20	*	....	....	....	155,000	Oct.	1887	1.87½
10	Badger, s.....	Cal.	250,000	50,000	5	....	....	....	....	37,500	Mar.	1890	.25
11	Bassick, G. S.....	Colo.	10,000,000	100,000	100	*	....	....	....	400,000	Mar.	1884	1.00
12	Belle Isle, s.....	Nev..	10,000,000	100,000	100	....	....	....	....	300,00.	Dec	1879	.25
13	Belcher, G. S.....	Nev.	10,400,000	104,000	100	....	....	....	....	15,397,000	Apl.	1876	1.00
14	Bellevue Idaho, s. L.	Idah.	1,250,000	125,000	10	120,000	Dec.	1889	.25	2 0.0 00	Jan.	1887	10
15	Bodie Con., G. S....	Cal.	10,000 000	100 000	100	575,000	Nov	1889	25	1 602 572	Apl.	1885	50
16	Boston & Mont, G....	Mon	2,500,000	250,000	10	*	....	....	....	520,000	Jun.	1886	.15
17	Boston & Mont., C.s.	Mon	2,500,000	100,000	25	*	....	....	....	1,100,000	Feb.	1890	1.00
18	Breece, s.....	Colo	5,000,000	200,000	25	*	....	....	....	2,000	Feb.	1880	.01
19	Brooklyn Lead, L. S.	Utah	500,000	100,000	5	....	....	....	....	175,000	Feb.	1887	.05
20	Bulwer, G.....	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	172,000	Jan.	1884	10
21	Bunker Hill & Sull..	Idah.	3,000,000	300,000	10	*	....	....	....	150,000	Oct.	1883	06¾
22	Caledonia, G.....	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	144,000	Apl	1889	.08
23	Calliope, s.....	Colo.	1,000,000	1	1	....	....	....	....	80,000	Mar.	1890	.01
24	Calumet & Hecla, C .	Mich	2,500,000	100,000	25	1,200,000	....	....	....	33,350,000	Feb.	1890	5.00
25	Carbonate Hill s. L..	Colo.	1,500,000	200,000	10	*	....	....	....	80,000	Apl.	1884	.05
26	Carlisle, G.....	N. M.	1,000,000	200,000	5	....	....	....	....	175,000	Feb.	1888	12½
27	Castle Creek, G.....	Idah.	100,000	100,000	1	....	....	....	....	51,000	Oct.	1888	.03
28	Catalpa, s. L.....	Colo.	3,000,000	300,000	10	*	....	....	....	270,000	May.	1884	.10
29	Central, c.....	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,950,000	Feb.	1890	1.00
30	Chrysolite, s. L....	Colo.	10,000,000	200,000	50	*	....	....	....	1,650,000	Dec	1884	.25
31	Colorado Central, s. L.	Colo.	2,750,000	275,000	10	*	....	....	....	406,250	Aug.	1889	.05
32	Confidence, s. L.....	Nev..	.....	24,000	....	306,160	Mar	1890	.75	199,680	Apl.	18 9	1.00
33	Cons. Cal. & Va., G. S.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,412,800	Feb.	1890	.50
34	Contention, s.....	Ariz.	12,500,000	250,000	50	....	....	....	....	12 587,500	Dec.	1884	.25
35	**Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10	....	....	....	....	210,000	Feb.	1889	.50
36	Crescent, S. L. G....	Utah	15,000,000	600,000	25	*	....	....	....	228,000	Oct.	1888	.03
37	Crown Point, G. S..	Nev..	10 000,000	100,000	100	2,850,000	Sept	1880	.50	11,588 000	Jan.	1875	2.00
38	Daly, s. L.....	Utah	3,000,000	150,000	20	*	....	....	....	1,425,000	Mar	1890	.25
39	Deer Creek, S. G....	Idah.	1 00,000	200,000	....	*	....	....	....	20,000	Jun.	1889	.05
40	Deadwood-Terra, G..	Dak.	5,000,000	200,000	25	*	....	....	....	41,000,000	Nov.	1887	.10
41	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec.	1881	.10	210.000	Oct	1889	.10
42	Dunkin, s. L.....	Colo.	5,000,000	200 000	25	*	....	....	....	390,000	Oct.	1889	.05
43	Dunstone, G. S. L....	Mont	1, 00,000	200,000	5	*	....	....	....	6,000	Nov.	1888	.03
44	Eclipse.....	Colo.	1,00,000	100,000	1	....	....	....	....	20,000	Nov.	1887	.10
45	Elkhorn, G. S.....	Mont	1,000,000	100,000	10	50,000	July	1883	.50	850,000	July	1887	.05
46	Empire L'd., G. S....	Mont	5 00,000	100,000	5	....	....	....	....	70,500	Oct.	1887	.37½
47	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	650,000	Jun.	1889	.50	4,955,000	July	1888	.25
48	Evening Star, S. L....	Colo.	500,000	50,000	10	*	....	....	....	1,45 .000	Dec.	1889	.25
49	Excelsior, G.....	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct..	1880	.25
50	Father de Smet, G..	Dak.	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec	1885	.20
51	Franklin, C.....	Mich	1,000,000	40,000	25	220,000	Jun.	1871	....	930,00 C	Jan.	1889	2.00
52	Freeland, G. S.....	Colo.	5,000,000	200,000	25	*	....	....	....	190,000	May	1886	.10
53	Garfield Lt., G. S....	Nev.	500,000	100,000	5	....	....	....	....	95,000	Apl.	1888	12½
54	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	4,434,600	Oct.	1889	.30	828,800	Oct.	1870	10.00
55	Grand Prize, s.....	Nev..	10,000,000	100,000	100	715,000	Nov.	1889	.30	525,000	Jan	1890	.30
56	Granite, s. L.....	Idah.	500,000	500,000	1	*	....	....	....	28,400	Oct.	1889	.02
57	Granite Mountain, s.	Mont	10,000,000	400,000	25	....	....	....	....	8,200,000	Feb.	1890	.50
58	Green Mountain, G..	Cal..	1,250,000	125,000	10	*	....	....	....	212,000	Nov.	1881	.07½
59	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	5,086,000	July	1887	.50	1,102,000	July	1888	.50
60	Hecla Con., S. G. L. C.	Mont	1,500,000	30,000	50	*	....	....	....	1,837,500	Dec.	1889	.50
61	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*	....	....	....	197,973	July	1886	.06
62	Holmes, s.....	Mont	10,000,000	100,000	100	325,000	Mar.	1890	.25	75,000	Apl.	1886	.25
63	Holyoke, G.....	Utah	200,000	200,000	1	*	....	....	....	27.000	Feb	1883	.10
64	Homestake, G.....	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,618,750	Mar.	1890	.10
65	Honorine, s. L.....	Utah	500,000	250,000	2	37,500	Apl.	1889	.05	125,000	Sept	1887	.05
66	Hope, s.....	Mont	1,000,000	100,000	10	*	....	....	....	223,252	Apl.	1888	.25
67	Horn-Silver, s. L....	Utah	10.000.000	400,000	25	*	....	....	....	4,100,000	Mar.	1890	.12½
68	Hubert, G.....	Colo.	1,000,000	1 mil'n	1	*	....	....	....	247.000	Dec.	1889	.00½
69	Idaho, G.....	Cal..	310,000	3,100	100	....	....	....	....	5,235,900	Dec.	1889	5.00
70	Ideal, s. L.....	Colo.	1,500,000	50,000	10	*	....	....	....	15.000	Oct.	1886	.05
71	Illinois, s.....	N. M.	100,000	100,000	1	....	....	....	....	45,000	Apl	1889	.20
72	Independence, s.....	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
73	Iron Hill, s.....	Dak.	2,500,000	250,000	10	134,000	July	1889	.08	156,250	Nov	1887	.07½
74	Iron-Silver, S. L....	Colo.	10,000,000	500,000	20	*	....	....	....	2,500,000	Apl.	1889	.20
75	Jackson, G. S.....	Nev.	5,000,000	50.000	100	237,500	Nov	1880	.20	55,000	Jun	1889	.10
76	Jay Gould	Mont	2,000,000	40,000	5	*	....	....	....	395,000	Apl.	1889	.04
77	Jocustita, 4	Mex.	2,500,000	250,000	10	*	....	....	....	1,200,000	Feb.	1889	.50
78	Jumbo, G.....	Colo.	2,000,000	200,000	10	*	....	....	....	35,000	Oct.	1887	.02½
79	Kearsarge, C.....	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.00	100,000	Jan	1890	2.00
80	Kentuck.....	Nev.	3,000,000	30,000	100	369,000	Dec.	1889	.30	1,350,000	Dec.	1886	.10
81	La Plata, S. L....	Colo.	2,000,000	200,000	10	*	....	....	....	610,000	Sept	1882	.30
82	Leadville Cons., S. L.	Colo.	4,000,000	400,000	10	*	....	....	....	423,000	Apl.	1889	.05
83	Lexington, G. S.....	Mont	4,000,000	40,000	100	*	....	....	....	609,000	Jan.	1885	2.00
84	Little Chief, S. L....	Colo.	10,000,000	200,000	50	*	....	....	....	810,000	Jan.	1890	.05
85	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*	....	....	....	1,050,000	Mch.	1889	.50
86	Martin White, S.....	Nev..	10,000,000	100,000	100	100,000	Feb.	1890	.25	140.000	Dec.	1886	.25
87	Mary Murphy, G. S...	Colo.	350,000	3,500	100	*	....	....	....	175,000	May	1888	5.00
88	Matchless, S.....	Colo.	500.000	500,000	1	*	....	....	....	15,000	Feb.	1890	.00½
89	Minnesota, C.....	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,320,000	Mar.	1876	....
90	Mono, G.....	Cal..	5,000,000	100,000	100	102,850	Nov.	1889	.25	1,995,800	Mar.	1886	.25
91	Montana, Lt., G. S....	Mont	3,300,000	660,000	5	*	....	....	....	2,465,329	Apl.	1890	.06
92	Morning Star, s. L....	Colo.	1,000,000	100,000	10	*	....	....	....	850,000	Dec.	1889	.20
93	Moulton, s. G.....	Mont	2,000,000	400,000	5	*	....	....	....	380,000	Dec.	1887	.07½
94	Mount Pleasant, G...	Cal.	150,000	150,000	1	*	....	....	....	150.000	Feb.	1887	.30
95	Mt. Diablo, S.....	Nev	5,000,000	50,000	100	137,500	Jun.	1880	2.00	160,000	Oct.	1889	.20
96	Napa, G	Cal..	700,000	100,000	7	*	....	....	....	360,000	Feb.	1890	.10
97	Navajo, G. S.....	Apl.	10,000,000	100,000	100	485,000	Apl.	1888	.30	365,000	Aug.	1889	.10
98	New Guston, S.....	Colo.	500,000	100,000	5	*	....	....	....	287,500	Dec	1889	.87½
99	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*	....	....	....	30,000	Dec.	1885	.06½
100	Northern Belle, S....	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.30	2,400,000	Apl.	1883	50
101	North Belle Isle, S...	Nev..	10,000,000	100,000	100	400,000	Sept	1889	.20	230.000	May	1888	.50
102	North Star, G.....	Cal..	1,000,000	100,000	10	....	....	....	....	250.000	Dec.	1889	.50
103	Ontario, G.....	Utah	15,000,000	300,000	50	*	....	....	....	10,850,000	Mar.	1890	.60
104	Ophir, G. S.....	Nev..	10,000,000	100,000	100	4,159,440	May	1889	.50	11,995,800	July	1882	1.00
105	Original, S. C.....	Mont	1,500,000	60,000	25	*	....	....	....	123,000	July	1888	.05
106	Osceola, C.....	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,272,500	Mar.	1890	1 00
107	Oxford, G.....	N. S.	125,000	125,000	1	*	....	....	....	73,500	Sept	1888	.02
108	Paradise Valley, G. S.	Nev.	10,000,000	100,000	100	57,000	Apl.	1888	.15	150,000	Apl	1887	.10
109	Parrot, C.....	Mont	1,800,000	180,000	10	*	....	....	....	582,000	Mar	1890	.10
110	Peacock, S. G. C....	N.M.	2,000,000	200,000	10	*	....	....	....	6,000	Nov.	1886	....
111	Plumas Eureka, G...	Cal..	1,406,250	140,625	10	....	....	....	....	2,548,046	Oct.	1889	.37½
112	Plutus, G. S. C. L....	Colo.	2,000,000	200,000	10	*	....	....	....	30,000	Feb.	1886	.10
113	Plymouth Con., G...	Cal..	5,000,000	100,000	50	*	....	....	....	2.280.000	Feb.	1883	40
114	Quicksilver, pref., G.	Cal..	4,300,000	43,000	100	....	....	....	....	1,577,653	Feb.	1890	1.50
115	" com., G.	Cal..	5,700,000	57,000	100	....	....	....	....	643,867	July	1882	.40
116	Quincy, C.....	Mich	1,000,000	100,000	25	200,000	Dec.	1882	....	5,370,000	Jun	1890	3.00
117	Republic, C.....	Mich.	5,000,000	100,000	25	400,000	Dec.	1889	.30	4,312,587	Jun	1887	1.25
118	Richmond, S. L.....	Nev..	1,350,00	54,000	25	*	....	....	....	99,785	Feb.	1880	.50
119	Ridge, C.....	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	585,000	Mar.	1886	.05
120	Robinson Con., S. L..	Colo.	10,000,000	200,000	50	*	....	....	....	100,000	Dec.	1882	.50
121	Robert E. Lee, S. L....	Colo.	10,000,000	500,000	20	*	....	....	....	4,460,000	July	1889	3.00
122	Savage, G.....	Nev..	11,200,000	112,000	100	6,542,000	July	1889	.50	2,500	Apl.	1883	.01
123	Shoshone, G.....	Idah.	150,000	150,000	....	*	....	....	....	1,598,145	Apl.	1886	12½
124	Sierra Buttes, G.....	Cal..	2,225 000	122,500	10	....	....	....	....	102,000	Jan.	1871	1.00
125	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,250,000	Oct.	1889	.50	270,000	Apl.	1889	.10
12	Sierra Nevada, S. L..	Idaho	1,000,000	1	1	....	....	....	....	40,000	May	1889	02
127	Silver Cord, G. S. L..	Colo.	4,500,000	450,000	10	*	....	....	....	270,000	Apl	1889	.10
128	Silver King, G.....	Ariz.	10,000,000	100,000	100	80,000	Jan.	1890	.30	1,950,000	July	1887	.25
129	Silver Mg. of L.....	N. M.	500,000	500,000	1	*	....	....	....	75,000	Feb.	1890	.05
130	Silverton, G. S. L....	Colo.	2,000,000	200,000	10	*	....	....	....	60,000	Jan	1881	.25
131	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*	....	....	....	3,137,500	Jun	1889	.10
132	Spring Valley, G.....	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	3,595,000	Jun.	1888	.05
133	Standard, G. S.....	Cal..	10 000,000	100,000	100	50,000	Feb.	1890	.25	155,000	Nov.	1881	.05
134	Stormont, S	Utah	500,000	500,000	1	*	....	....	....	844.00.	Dec.	1887	.20
135	St. Joseph, L.....	Mo.	1,500,000	150,000	10	*	....	....	....	9,000	Apl.	1888	.02½
136	Swansea, G.....	Colo.	600,000	60,000	10	*	....	....	....	100,000	Nov	1881	20
137	Tamarack, C.....	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	1,44 ,000	Apl.	1882	10
38	Tip Top, S	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	1,250,000	Apl.	1890	3.00
139	Tombstone, G. S. L..	Ariz.	12,500,000	500,000	25	*	....	....	....	97,500	Feb.	1884	.20
140	United Verde, C.....	Ariz.	3,000,000	300,000	10	*	....	....	....	37,500	Apl	1886	2.50½
41	Valencia, M.....	N. M.	150,000	1,500	100	....	....	....	....	272,500	Oct.	1888	37½
142	Viola L't., S.....	Idah.	750,000	150,000	5	*	....	....	....	1,275,000	July	1887	.10
143	Ward Cons., S. L....	Colo.	2,000,000	200,000	10	....	....	....	....	2,000	Dec.	1889	.05
144	Yankee Girl	Colo.	2,500,000	250,000	10	*	....	....	....	2,184,000	Aug	1871	1.50
145	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,508,000	Mar	1889	.50	3,300	Jun	1889	.10
147	Webb City, L. Z.....	Mo...	55,000	11,000	5	....	....	....	....	25,000	Oct.	1889	.10
148	Woodside	Utah	.....	.....	....	....	....	....	....	175,000	....	1889	.25
149	Young America.....	Cal..	.....	.....	....	....	....	....	....	.....	....	1889	.10

NON-DIVIDEND PAYING MINES

	Name and Location of Company.		Capital Stock.	Shares. No.	Par Value.	Assessments. Total levied.	Date & am't of last.		
1	Agassiz Cons., s. L..	Colo.	$2,500,000	50,000	$50	*	....	....	....
2	Alleghany, s	Colo.	5,000,000	500,000	10	.....	....	....	....
3	Alloues, c.....	Mich	2,000,000	80,000	25	$737,000	Jan.	1890	.50
4	Alpha Con., G. S....	Nev..	3,000,000	30,000	100	558,750	July	1888	.07½
5	Alta, s.....	Nev..	10,080,000	100,800	100	2,248,800	Sept	1888	60
6	Amador, G.....	Cal..	400,000	200,000	2	*	....	....	....
7	American Flag, S....	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.10
8	Amity, s.....	Colo.	250,000	250,000	1	*	....	....	....
9	Anglo-Montana, Lt.	Mon.	600,000	120,000	5	.....	....	....	....
10	Astoria, G.....	Cal..	200,000	100,000	2	*	....	....	....
11	Barcelona, G.....	Nev..	5,000,000	200,000	25	*	....	....	....
12	Bechtel Con., G....	Cal..	10,000,000	100,000	100	173,500	Jan.	1883	.10
13	Benwood, S.....	Nev.	5,000,000	50,000	100	735,000	Apl.	1886	.10
14	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	3,180,590	Jan.	1890	.20
15	Big Pittsburg, s. L..	Colo.	20,000,000	200,000	100	*	....	....	....
16	Bi-Metallic, s.....	Mon.	5,000,000	200,000	25	*	....	....	....
17	Black Oak, G.....	Cal..	3,000,000	300,000	10	*	....	....	....
18	Boston Con., G ...	Cal..	10,000,000	100,000	100	170,000	Nov	1883	.35
19	Bremen, s.....	N. M.	5,000,000	500,000	10	*	....	....	....
20	Brownlow, s	Colo.	250,000	250,000	1	.....	....	....	....
21	Brunswick, G.....	Cal..	2,000 000	400,000	5	.....	....	....	....
22	Bullion, G. S.....	Nev..	10,000,000	100,000	100	4,007,000	Aug.	1888	.50
23	Calaveras, G.....	Cal..	500,000	500,000	1	*	....	....	....
24	Carisa, G.....	Wy	500.000	100,000	5	*	....	....	....
25	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*	....	....	....
26	Cashier, G. S.....	Colo.	500,000	250,000	2	*	....	....	....
27	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	*	....	....	....
28	Cherokee, G.....	Cal..	1,500,000	150,000	10	.....	....	....	....
29	Chollar, S.....	Nev..	11,200,000	112,000	100	1,484,000	July	1889	.50
30	Cleveland, T.....	Dak.	1,000,000	500.000	2	*	....	....	....
31	Coichis.....	N. M.	500,000	50,000	10	.....	....	....	....
32	Commonwealth, s..	Nev.	10,000,000	100,000	100	170,000	Nov.	1889	.50
33	Comstock, G. S.....	Nev..	10,000,000	100,000	100	30 000	Mar.	1887	.15
34	Con. Imperial, s....	Nev..	5,000,000	50,000	100	1,802,500	Nov.	1889	.05
35	Con. Pacific, G. S..	Cal..	6,000 000	60,000	100	192,000	Oct.	1889	.10
36	Cons. Silver, s.....	Mo...	2,500,000	250,000	10	*	....	....	....
37	Crescent, s. L.....	Colo.	3,000,000	300,000	10	*	....	....	....
38	Crocker, S.....	Ariz.	10,000,000	100,000	100	135,000	Jan.	1890	.10
39	Crowell, G.....	N. C.	500,000	500,000	1	.....	....	....	....
40	Dahlonega, G.....	Ga..	250,000	250,000	1	*	....	....	....
41	Dandy, S.....	Colo.	5,000,000	500,000	10	*	....	....	....
42	Decatur, s.....	Colo.	1,500,000	300,000	5	*	....	....	....
43	Denver City, s. L ..	Colo.	5,000,000	500,000	10	*	....	....	....
44	Denver Gold, G.....	Colo.	300,000	60,000	5	*	....	....	....
45	Durango, G.....	Colo.	500,000	500,000	1	*	....	....	....
46	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990.000	Mar.	1886	1.00
47	El Cristo, G. S.....	U.S.C	1,000,000	500,000	2	*	....	....	....
48	El Dorado, G.....	Cal..	1,000,000	250,000	4	*	....	....	....
49	El Talento, G.....	U.S.C	1,000,000	500,000	2	*	....	....	....
50	Empire, s.....	Utah	10,000,000	100,000	100	*	....	....	....
51	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	*	....	....	....
52	Exchequer	Nev.	10,000,000	100,000	100	515,000	Apl.	1889	.25
53	Found Treasure, G. S.	Nev..	10,000,000	100,000	100	30,590	Apl	1889	12½
54	Gogebic L. Syn., I..	Wis.	5,600,000	200,000	25	.....	....	....	....
55	Gold Cup, s.....	Colo.	500,000	500,000	1	*	....	....	....
56	Golden Era, s.....	Mon.	2 000,000	200,000	10	*	....	....	....
57	Gold Placer, G.....	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
58	Gold Rock, G.....	Cal..	1,000,000	500,000	2	*	....	....	....
59	Goodshaw, G.....	Cal..	10,000,000	100,000	100	*	....	....	....
60	Grand Belt, C.....	Tex.	12,000,000	120,000	100	*	....	....	....
61	Grand Duke.....	Colo.	800,000	80,000	10	*	....	....	....
62	Great Remance, G...	U.S.C	1,000,000	500,000	2	*	....	....	....
63	Gregory-Boltail, G..	Colo.	550,000	550,000	1	*	....	....	....
64	Gregory Con., G....	Mon.	3,000,000	300,000	10	*	....	....	....
65	Harlem Al. & Co. G.	Cal.	1 000,000	200,000	5	*	....	....	....
66	Head Cent. & Tr. s. a	Ariz.	10,000,000	100,000	100	*	....	....	....
67	Hector, G.....	Cal..	1,500,000	300,000	5	45,000	Jan.	1889	.15
68	Highland, C.....	Mich	500,000	25,000	20	*	....	....	....
69	Hollywood.....	Cal..	200,000	100,000	2	*	....	....	....
70	Hortense, s.....	Colo.	2,000,000	200,000	10	*	....	....	....
71	Huron, G. S.....	Nev..	1,000,000	40,000	25	280,000	May	1887	3.00
72	Iron Gold & Silver, s	N. M.	2,000,000	200,000	10	*	....	....	....
73	Ironton, L'd.....	Wis.	1,000,000	40.000	25	*	....	....	....
74	Iroquois, C.....	Micq	1,250,000	50,000	25	*	....	....	....
75	J. D. Reymert.....	Aris.	10,000,000	100,000	100	*	....	....	....
76	Julia Cons., G. S...	Nev..	11,000,000	110,000	100	1,650,000	Jan.	1889	.10
77	Lacrosse, G.....	Colo.	1,000,000	100,000	10	*	....	....	....
78	Lee Basin, G.....	Colo.	5,000,000	500,000	10	*	....	....	....
79	Mayflower Gravel...	Cal..	1,000,000	100,000	10	685,000	Mar.	1890	.50
80	May Mazeppa, s.....	Colo	500,000	500,000	1	.....	....	....	....
81	Medora, G.....	Dak	250,000	250,000	1	.....	....	....	....
82	Mexican, G. S.....	Nev.	10,000,000	100,000	100	2,500,760	Dec.	1889	.25
83	Middle Bar G.....	Cal.	400,000	200,000	2	*	....	....	....
84	Mike & Starr, S. L...	Colo	1,000,000	200,000	5	*	....	....	....
85	Mollie Gibson.....	Colo.	2,000,000	100,000	2	*	....	....	....
86	Monitor, G.....	Colo.	100,000	1,000,000	1	*	....	....	....
87	Mutual Mg. & Sm.	W'sh	100,000	1,100,000	1	*	....	....	....
88	Native, C.....	Mich	1,000,000	40,000	25	*	....	....	....
89	Neath, G.....	Colo.	1,000,000	100,000

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES

NAME AND LOCATION OF COMPANY.	March 29.		March 31.		April 1		April 2.		April 3		†April 4		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Alice, Mont.	....	....	....	....	....	....	1.25	....	....	....	....	....	500
Argenta, Nev.	.14	....	....	....	....	....	....	....	....	....	....	....	200
Aspen Mg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Belcher	....	....	....	....	....	....	....	....	....	....	....	....	....
Belle Isle, Nev.	....	....	....	....	.25	....	....	....	....	....	....	....	100
Bodie Cons., Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bos. & Mont., Mont.	....	....	....	....	....	....	....	....	....	....	....	....	....
Breece, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bulwer, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Caledonia, Dak	2.00	....	....	....	2.60	....	....	....	....	....	....	....	600
Calumet & Hecla	....	....	....	....	....	....	....	....	....	....	....	....	....
Colorado Central	....	....	....	....	.80	....	....	....	....	....	....	....	1,000
Cons. Cal. & Va., Nev.	4.80	....	4.65	....	4.75	....	4.80	....	....	....	....	....	500
Crown Point, Nev.	2.20	....	2.05	....	2.30	....	....	....	....	....	....	....	300
Deadwood, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka Con.	....	....	....	....	....	....	....	....	....	....	....	....	....
Father de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Freeland, Colo.	1.15	1.00	1.15	1.10	1.25	1.10	1.20	1.10	1.20	1.10	....	....	18,700
Gould & Curry, Nev.	1.80	....	1.75	....	1.80	....	....	....	‡1.92	....	....	....	400
Hale & Norcross, Nev	2.90	....	3.80	....	....	....	....	....	3.05	....	....	....	300
Holyoke, Id.	....	....	....	....	....	....	....	....	....	....	....	....	....
Homestake, Dak.	....	....	....	....	....	....	....	....	....	....	....	....	....
Horn-Silver, Ut.	2.30	....	2.30	....	2.35	....	2.40	....	2.35	....	....	....	1,450
Iron Hill	.52	....	....	....	....	....	....	....	1.95	....	....	....	20
Iron Silver, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	300
Leadville C., Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief, Colo.	....	....	....	....	.29	....	.29	....	.30	....	....	....	600
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Moulton, Mont.	....	....	....	....	....	....	.45	....	....	....	....	....	1,500
Mi. Diablo, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Navajo, Nev.	....	....	.39	....	....	....	....	....	....	....	....	....	200
North Belle Isle, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
North Star, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Ut.	....	....	....	....	40.50	40.00	....	....	41.50	....	....	....	230
Ophir, Nev.	4.00	....	....	....	....	....	....	....	4.25	....	....	....	100
Osceola, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Plutus, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Plymouth, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Quicksilver, Pref.	....	....	....	....	....	....	36.50	38.00	....	....	....	....	200
Com.	....	....	....	....	6.63	6.25	....	....	....	....	....	....	150
Robinson Cons. Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Savage, Nev.	....	....	....	....	2.30	....	....	....	2.25	....	....	....	200
Sierra Nevada, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Cord	....	....	....	....	.43	.40	....	....	....	....	....	....	500
Silver King	....	....	.36	.35	....	....	.39	....	....	....	....	....	600
Silver Mg. of L. V.	....	....	....	....	....	....	....	....	....	....	....	....	....
Small Hopes, Colo.	....	....	....	....	1.00	....	....	....	....	....	....	....	100
Standard, Cal	.25	.20	....	....	....	....	.50	....	.22	....	....	....	800
Tamarack	....	....	....	....	....	....	....	....	....	....	....	....	....
Yellow Jacket	....	....	2.35	....	2.60	....	....	....	....	....	....	....	250

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 29.		March 31.		April 1		April 2.		April 3.		†April 4.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Alta, Nev.	1.45	....	1.35	....	....	....	....	....	....	....	....	....	....
Andes, Nev.	1.00	....	....	....	....	....	....	....	....	....	....	....	200
Amador, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	100
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Astoria, Cal.	.06	....	.06	....	....	....	....	.05	....	.05	....	....	....
Barcelona, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	9,000
Bechtel, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Best & Belcher, Nev	....	....	....	....	....	....	3.15	....	2.35	....	....	....	....
Brunswick, Cal.	....	....	....	....	....	....	.52	.50	.52	....	.53	.52	300
Bullion, Nev.	1.80	1.60	1.85	....	....	....	1.80	1.75	....	....	....	....	12,200
Eutte & Bost., Mont.	....	....	....	....	....	....	....	....	....	....	....	....	700
Castle Creek, Id.	....	....	....	....	....	....	....	....	....	....	....	....	....
Cholar, Nev	....	....	3.25	....	....	....	....	....	....	....	....	....	....
Col. & Beaver, Id.	....	....	....	....	....	....	....	....	....	....	4.25	....	200
Commonw., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Comstock T., Nev.	....	....	.18	.17	....	....	....	....	....	....	....	....	....
" bonds.	....	....	....	....	....	....	27.00	....	....	....	....	....	2,000
" scrip	....	....	....	....	....	....	....	....	....	....	....	....	1,000
Con. Imperial, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Del Monte, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, Rep. of Col.	1.45	....	1.45	....	1.55	1.50	1.50	....	1.50	....	....	....	800
Excelsior, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchequer Nev.	1.10	....	1.80	....	....	....	....	....	....	....	....	....	200
Julia, Nev.	.40	....	....	....	....	....	....	....	....	....	....	....	100
Kingst'n & Pemb'ke	....	....	....	....	.55	....	....	....	....	....	....	....	100
Kossuth, Nev.	.14	....	....	....	....	....	....	....	....	....	....	....	100
Lacrosse, Colo.	.07	....	.07	....	.08	.07	.07	....	.07	....	....	....	5,600
Lee Basin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mexican, Nev.	3.80	....	....	....	3.90	....	....	....	....	....	....	....	200
Middle Bar, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Moulton, Mont	....	....	....	....	....	....	....	....	....	....	....	....	....
Mutual Sm. & M. Co	1.70	....	1.65	....	1.65	....	....	....	....	....	1.70	....	800
Nevada Queen, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Com'nw'th, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Occidental, Nev.	1.10	....	....	....	1.10	....	....	....	....	....	....	....	200
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Overman, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ariz.	.90	.88	.90	.87	.90	.89	.91	.87	.90	.89	....	....	10,600
Potosi, Nev.	4.90	....	4.70	....	....	....	....	....	....	....	....	....	200
Rappahann'k, Va.	.06	....	....	....	....	....	....	....	....	.05	....	....	1,300
S. Sebastian, San S	....	....	....	....	....	....	....	....	....	....	....	....	....
Scorpion, Nev.	.35	....	....	....	....	....	....	....	....	....	....	....	200
Shoshone Idaho	....	....	....	....	....	....	....	.02	....	....	....	....	100
Silver Hill, Nev.	.75	....	....	....	....	....	....	....	....	....	....	....	200
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
" Trust Cert.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutter Creek, Cal.	1.40	1.30	1.45	1.40	1.50	1.40	1.50	....	1.50	1.40	....	....	9,300
Tornado, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Union Cons., Nev.	....	....	....	....	2.60	....	....	....	....	....	....	....	100
Utah, Nev.	1.00	....	.75	....	.70	....	....	....	....	....	....	....	1,000
Wall St. M. & M. Co.	....	....	....	....	.75	.58	.72	.63	.73	.70	....	....	56,3 10

Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities; ‡Assessment Paid. Dividend shares sold, 29,800. Non-dividend shares sold, 113,810. Total, New York, 143,610.
*Good Friday

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Mch. 28.		Mch. 29		Mch. 31.		April 1.		April 2.		April 3*		SALES.
Atlantic, Mich.	13.25	....	....	....	....	....	13.63	13.50	....	....	....	....	260
Bodie, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bonanza Developm't	.88	....	....	....	.85	....	.85	....	.85	....	....	....	500
Bost. & Mont., Mont.	48.63	48.25	....	....	49.00	48.50	49.00	48.75	49.00	48.63	....	....	1,505
Breece, Colo.	....	....	....	....	.35	....	.35	....	....	....	....	....	200
Calumet & Hecla, Mich.	....	....	....	....	.257	.256	260	.257	260	....	....	....	33
Catalpa, Colo.	.20	....	....	....	.22	....	.22	....	.20	....	....	....	830
Central, Mich.	....	....	....	....	....	....	8.00	....	....	....	....	....	50
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal. & Va., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo.	.63	....	.55	....	....	....	....	....	.60	....	....	....	350
Enterprise	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich.	14.75	....	....	....	15.00	13.75	14.25	....	14.25	....	....	....	328
Freelsnd, Col.	....	....	....	....	....	....	1.15	....	....	....	....	....	100
Honorine, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Pittsburg, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Moulton	....	....	....	....	....	....	....	....	....	....	....	....	....
Napa, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Osceola, Mich.	27.75	27.00	28.25	27.50	28.50	28.25	28.25	27.75	28.00	27.75	....	....	2,070
Pewabic, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Quincy, Mich.	72.00	....	....	....	....	....	....	....	74.00	72.00	....	....	27
Ridge, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nev., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver King, Ariz.	....	....	....	....	....	....	....	....	....	....	....	....	....
Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Tamarack, Mich.	188	....	159	....	....	....	....	....	....	....	....	....	42

NAME OF COMPANY.	Mch. 28.		Mch. 29.		Mch. 31.		April 1		April 2.		April 3*		SALES
Allouez, Mich.	3.00	....	....	....	3.00	....	3.00	....	3.00	....	....	....	450
Arnold, Mich.	....	....	....	....	.33	....	....	....	.30	....	....	....	300
Aztec, Mich.	.08	....	....	....	....	....	....	....	.08	....	....	....	3.0
Bowman	....	....	....	....	....	....	....	....	....	....	....	....	....
Butte & Bost., Mont.	14.13	....	14.38	....	19.00	....	....	....	14.00	....	....	....	435
Centennial, Mich.	....	....	....	....	.13	....	....	....	....	....	....	....	160
Claudia J., Colo.	....	....	....	....	....	....	.09	....	.09	....	....	....	200
Crescent, Colo.	.10	....	....	....	....	....	....	....	....	....	....	....	1,300
Dana	....	....	....	....	....	....	.38	....	....	....	....	....	....
Don Enrique, N. M.	....	....	....	....	....	....	....	....	....	....	....	....	100
El Cristo, S. A.	....	....	....	....	....	....	.10	....	....	....	....	....	....
Hanover, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	250
Humboldt, Mich.	....	....	....	....	3.50	....	3.50	....	3.50	....	....	....	300
Hungarian	....	....	....	....	....	....	....	....	....	....	....	....	....
Huron, Mich.	12.00	11.50	11.50	11.25	13.00	11.50	12.88	12.50	13.13	12.50	....	....	5,755
Kearsarge	.35	....	....	....	.35	....	....	....	.33	....	....	....	300
Mesnard, Mich.	....	....	....	....	....	....	....	....	1.50	....	....	....	200
National, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	200
Native, Mich.	....	....	....	....	.90	....	....	....	.90	....	....	....	200
Phœnix, Ariz.	....	....	....	....	....	....	....	....	....	....	....	....	....
Pontiac, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Rappahannock, Va.	....	....	....	....	....	....	....	....	....	....	....	....	....
Rockland	....	....	....	....	....	....	....	....	....	....	....	....	....
Santa Fe, N. Mex.	.90	.80	.80	.75	.80	.75	.75	.68	.70	.60	....	....	24,560
Security, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Shoshone, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....
South Side, Mich.	....	....	....	....	....	.15	....	....	....	....	....	....	100
Star	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....

* Holy Thursday. Boston: Dividend shares sold, 6,295. Non-dividend shares sold, 35,110. Total Boston, 41,405.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	March 29.		March 31.		April 1.		April 2.		April 3.		April 4.*		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cambria Iron.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron Coal & Iron Co	....	3	....	....	....	3	....	3	....	....	....	....	....	500
Ches. & O. RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Chic. & Ind. Coal RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Col. & Hocking Coal	100	20¼	....	21	20½	22⅛	....	22	....	23¼	22½	....	....	1,870
Col., C. & I	100	....	....	45	44⅞	45⅝	....	46	....	46	45¾	....	....	950
Consolidation Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. C.	100	149⅜	149	150	....	149⅜	149¼	149¼	149	149⅞	149¾	....	....	1,098
D., L. & W. RR.	50	136½	135⅝	135¾	135¼	136¼	135¾	136¼	134⅝	136	135⅛	....	....	54,870
Hocking Valley.	100	....	....	22⅛	21⅞	22	....	....	....	22¼	....	....	....	1,000
Hunt. & Broad Top	....	....	....	....	....	15¾	....	16¾	....	17¼	....	....	....	215
Do. pref.	....	....	....	43	....	43	....	44	43	....	....	....	....	162
Illinois Coal & Coke Co.	....	30⅝	....	30¾	30⅜	....	....	30¾	....	30⅞	....	....	....	500
Lehigh C. & N.	50	51⅜	51½	51⅜	....	51⅜	51¼	51¼	....	51¼	....	....	....	275
Lehigh Valley RR.	50	52	....	52	....	52	51⅜	51⅜	51¼	51¾	51¼	....	....	1,949
Lehigh & Wilkesb. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Mahoning Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Maryland Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Essex.	100	....	....	....	....	....	....	....	....	150½	150	....	....	178
New Central Coal.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
N. J. C. R.R.	100	120	119	119½	117¾	119	118¼	119½	117⅝	119	....	....	....	5,150
N. Y. & S. Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., Susq. & Western	100	....	....	....	....	6½	....	....	....	....	....	....	....	500
Do. pref.	100	....	....	27½	....	28	27	....	....	....	....	....	....	300
N. Y. & Perry C. & I.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Norfolk & Western R.R.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. Coal.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. RR.	50	53¾	53⅝	53¾	53¾	53⅝	52⅝	53¾	53⅝	53⅞	53⅝	....	....	2,330
*Ph. & R. RR.	....	40¾	40⅝	40⅝	40¼	40⅛	40⅝	42¼	41	42⅛	41⅝	....	....	110,798
Sunday Creek Coal.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Tennessee C. & I. Co.	....	50½	49½	49½	47¾	51	49¼	51½	50¼	53	51	....	....	7,600
Do. pref.	....	....	....	....	....	....	....	101	100	....	....	....	....	250
estmoreland Coal.	....	....	....	....	....	....	....	....	....	....	....	....	....	....

**Sales in New York, 77,975; in Philadelphia, 32,823. Total sales, 190,504. *Good Friday.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. March 28.	March 29.	March 31.	April 1.	April 2.	April 3.
Alpha	....	....	....	....	....	....
Alta	1.25	....	1.40	1.35	1.20	1.10
Belcher	....	....	....	....	....	....
Belle Isle	.20	.20	.20	....	....	....
Best & Bel.	3.05	3.05	3.10	3.70	3.50	3.15
Bodie	.50	....	.60	....	.60	....
Bulwer	.20	.20	.20	.25	....	....
Challar	3.45	3.20	3.95	4.05	4.00	3.70
C'm'weal'h	2.65	2.60	2.65	....	....	2.85
Con. C. & V	4.75	4.50	4.50	4.90	4.85	4.65
Con. Pac.	....	....	....	....	....	....
Crown Pt.	2.20	2.10	2.20	2.65	2.50	2.15
Eureka C.	....	....	....	....	....	....
Gould & C.	1.70	1.65	1.70	2.15	1.95	1.85
Grd. Prize.	....	....	....	....	....	....
Hale & N.	2.80	2.70	2.90	3.45	3.20	2.85
M. White.	....	....	....	....	....	....
Mexican	3.50	3.25	3.45	3.95	3.65	3.45
Mono	.35	.40	.40	.40	....	....
Mt. Diablo	2.75	....	....	....	....	....
Navajo	....	....	....	....	....	....
Nev. Queen	....	.60	.65	.65	.65	....
N. Belle I.	....	1.00	1.15	1.10	....	1.00
Occidental	....	....	....	....	....	....
Ophir	4.40	4.40	4.45	4.70	4.40	4.15
Potosi	4.45	4.55	4.70	5.50	4.80	3.80
Savage	1.95	1.85	2.00	2.40	2.40	2.15
Sierra Nev.	2.50	2.35	2.45	2.80	2.60	2.40
Union Con.	2.40	2.25	2.35	2.70	2.65	2.45
Utah	.60	.65	.60	.85	.70	.70
Yellow Jkt.	2.35	2.25	2.50	2.80	2.65	2.30

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	....	....
Balt. & N. C.	.08	.15
Big Vein Coal	....	....
Conrad Hill	....	.10
Cons. Coal	.23	.25
Diamond Tunnel	....	.40
George's Crk. C	1.05	1.10
Lake Chrome	.15	.25
Maryland & Charlotte	....	....
North Star	....	.25
Silver Valley	.50	....

Prices bid and asked, lowest and highest, during the week ending April 3d.

Birmingham, Ala.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. R. Mill Co.	$100	$60
*Alice Furnace	$104⅛	....
Anna Howe G. Mg. Co	$⅜	$⅜
Bessmer Land	$37⅛@$38¼	$38⅛@$ 9
Bir. Mg.& M g.	$85	$103@$105
Cahaba Coal Mg Co	$55	$65
Camille Gold Mg. Co	$⅛	$1⅛
De Bardeleben C. & I. Co	$73	$81
Decat. L. Imp.	$10¾	$11⅛
DecaturMin. L.	$21	$23
Ensley Land	$8	$10
*Eureka	$100@$115	$121
Florence L. & Mg. Co	$ 9@$ 0	$23
Gadsen Land	$6¼@$7	$7⅛@$7⅜
Hecla Coal Co.	$40	....
Hen. S. & M.Co	$90@$101	....
Mag-Ellen	$100	....
Mary Lee C. & R. Co	$30	....
Sheffield C & I. Co	$67	$71@$71⅛
Sloss I. & S.	....	$57
†Sloss I. & S.	$94	$9 ⅛
††Sloss I. & S.	$77⅛@$78	....
Tuscaloose C. I. & L. Co	$21	....
Tenn.C. & I. Co.	$48@$53	$49@$54
" pref.	$100	$108
Woodstock I. Co.	$53¾@$54½	$55

Prices, highest and lowest, bid and asked during week ending March 31st.

* Bonds. † First mortgage. †† Second mortgage.

Pittsburg, Pa.

COMPANY.	B.	A.	Closing
Allegheny Gas Co.	$40.00	....	$40.00
Bridgewater Gas Co.	30.00	....	30.00
Chartiers Val. Gas	46.75	48.50	47.00
Columbia Oil Co.	2.00	3.00	2.50
Consolidated Gas Co.	38.00	....	38.00
East End E. Light Co.	60.00	....	60.00
East End Gas Co	....	....	....
Forest Oil	105.00	....	105.00
Hazlewood Oil Co.	....	....	....
La Noria Mining	13.00	25.00	25.00
Luster Mg. Co.	14.50	17.75	17.13
Manufacturers Gas Co.	....	....	....
Nat. Gas Co. of W. Va	....	70.00	70.00
N.Y.& Clev.Gas Coal.	30.50	32 50	32.50
Ohio Valley Gas	....	....	....
Mansfield C. & C. Co.	....	....	....
Pennsylvania Gas	14.00	....	14.50
People's Natural Gas.	....	40.00	40.00
People's N. G. & P. Co.	....	17.00	17.00
Philadelphia Co.	31.00	32.50	32.25
Pine Run Gas Co.	....	61.00	61.00
Pittsburg Gas	72.00	....	72.00
Silverton Mg. Co.	....	1.25	1.25
South Side Gas.	....	....	....
Tuna Oil Co.	....	70.00	70.00
Union Gas	....	....	....
Washington Oil Co.	80.00	81.00	80.00
W'house Brake Co.	50.00	....	50.00
W'house A. B. Co.	111.50	115.00	115.00
W'house E. Light.	44.00	46.00	45.25
W'moreland & Camb.	....	....	....
Wheeling Gas	19.00	21.00	20.00
Yankee Girl Mg.	....	2.75	2.75

* Actual selling price.

Prices bid, asked and closing during the week ending April 3.

Sales at the New York Stock Exchange week ending April 4:

	Sales.	Price H.	Price L.
*American Cotton Oil	2,300	26¼	26⅛
National Lead	7,320	18⅛	17⅛
Sugar	23,785	64	62⅞

* Trust receipts.

St. Louis. April 2.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo	$ .75	$ 1.00
American & Nettie	1.78	1.80
Anderson	....	....
Aztec, N. Mex	.24	.25
Bi-Metallic	27.00	....
Black Oak, Cal	.01	.02
Black Spar	....	....
Bremen	....	.02⅛
Buckskin	.06	.07
Carriboo, Idaho	....	....
Central Silver	.17⅛	.20
Cleveland, Colo.	.03	.04½
Cleveland, Idaho	....	.40
Cœur d'Alene	.70	....
Dinero, Colo.	.00½	.01½
Golden Era, Mont	.02	.02½
Golden King	.11	.12
Gold Run	....	....
Granite Mountain, Mont.	42.25	43.00
Hope, Mont	2.57½	....
Ingram	.55	.68¾
Iron Clad	....	....
Ivanhoe, Colo.	.03	....
I. X. L., Colo.	....	....
Keystone	.03	.03½
La Union	.14	.15
Little Giant	.02	.03
Major Budd, Mont.	.14	.15
Mexican Imp., Mex.	.17½	.18¾
Michael Breen	.60	.70
Montrose Placer, Colo.	.37½	.45
Mountain Key	.60	.65
Mountain Lion	.06¾	.07½
Neath, Colo.	.13	.15
Old Colony	....	....
Old Jesuit	....	....
Pat Murphy, Colo.	.08	.08½
Pedro	.02	.03
Phillips, Colo.	....	....
Pine Grove, Idaho	.04	.05
Queen of the West, Idaho	.09½	.11
Raspberry, Mont.	....	....
San Francisco, Mont.	.02	.02½
Silver Age, Colo.	1.50	1.70
Silver Bell	....	....
Small Hopes, Colo.	....	.90
Tourtelotte, Colo.	.04½	.05
West Granite, Mont.	.80	.90
Wire Patch	.15	....
Yuma, Ariz.	.62½	.70

Trust Stocks. April 4.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

American Cotton Oil, old	$28	@$32
*American Cotton Oil new	..	@ ..
Cattle Trust	11	@ 15
Distillers' & Cattle Feeders'.	39	@ 39⅛
Linseed Oil	44	@ 44⅛
National Lead	17⅞	@ 18
Natural Gas	..	@120†
Standard Oil	165½	@167
Sugar Refineries	62¾	@ 63

*These are the American Cotton Oil Central Trust Co.'s receipts and are known as new, and represent the old certificates which have been deposited in the Central Trust Co. in furtherance of the reorganization plan—from a trust to a corporation

† Ex-dividend.

Foreign Quotations.

London.

COMPANY.	Highest.	Lowest.
Almada, Mex.	1s 3d.	9d.
Amador, Cal	18s.	16 .
Appalachian, N. C.	1s.	6d.
Canadian Phos. Canada.	£⅜	£⅛
Carlisle, N. Mex	3s	2s.
Colorado, Colo.	3s. 3d.	2s. 9d.
Comstock, Utah	....	....
Condova	....	....
Cons. Esmeralda, Nev.	3s. 3d.	2s. 9d.
Denver Gold, Colo.	1s.	6d.
Dickens Custer, Idaho.	2s.	1s. 6d.
East Arevalo, Idaho	3s.	2s.
Eberhardt, Nev	....	....
El Callao, Venezuela	....	....
Elmore, Idaho	2s. 6d.	2s.
Empire, Mont	....	6d.
Garfield, Nev.	4s	3s.
Jay Hawk Mont	3s.	2s. 6d.
Josephine, Cal	4s.	2s.
Kohinoor, Colo.	2s.3d.	1s. 9d.
La Luz, Mex.	1s. 6d.	1s.
La Trinidad, Mex	....	....
La Valera, Mexico	1⅛s.	1s.
Montana Lt., Mont	£1⅜	£1¼
New California, Colo.	8s.	7s.
New Consolidated	1s.	6d.
New Eberhardt, Nev.	1s.	6d.
New Emma, S., Utah	2s. 3d.	1s. 9d.
New Flagstaff, Utah.	2s.	1s. 6d.
Newfoundland, N. F.	3s.	2s. 6d.
N. Gold Hill, N. C.	1s.	6d.
New Hoover Hill, N. C.	1s. 6d.	1s.
Old Lout, Colo.	£15-16	£13-16
Palmarejo, Mex	17s 6d.	16s. 6d.
Pinos Altos, Mex.	£¾	£⅝
Pittsburg Cons., Nev.	2s.	1s.
Richmond Con., Nev.	1⅝s.	1⅛s.
Ruby&Dunderberg, Nev	1s. ½d.	6d.
Sam Christan, N. C.	2s. 3d.	1s. 9d.
Sierra Buttes, Cal.	5s.	4s.
" Plumas Eur.	£1	£⅞
Sonora, Mex	1s.	6d.
Stanly, N. C.	3s. 6d.	2s. 6d.
United Mexican, Mex.	3s 6d.	....
U. S. Placar, Colo.	2s. 6d	2s.
Viola Lt., Idaho	2s. 3d.	1s. 9d.

Highest and lowest prices during the week ending March 21d.

Paris.

	Francs.	Francs.
Belmez, Spain	675.00	675.00
Callao, Venez.	75.00	75.00
Callao Bis, Venez	4.00	4.00
East Oregon, Ore.	10.50	10 50
Forest Hill Divide, Cal.	180.00	180 00
Golden River, Cal	400.00	400.00
" " parts	65.00	65 00
Lexington, Mont.	135.00	135.00
" parts	4.25	4.25
Ouray, Colo.	10.00	10.00
Rio Tinto, Spain	375.00	375 00
Tharsis, Spain	115 00	115.00

Highest and lowest prices during the week ending March 20th.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18°, ℔ 100 lbs 1.00@1.50
Muriatic, 20°, ℔ 100 lbs. 1.12½@1.75
Muriatic, 22° ℔ 100 lbs. 1.37½@2.00
Nitric, 36°, ℔ 100 lbs. 4.00@4.25
Nitric, 42°, ℔ 100 lbs. 6.00@6.25
Oxalic, ℔ 100 lbs. 6.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 80@1.25
Sulphuric, 66°, ℔ 100 lbs. 1.00@1.75

Alkali—
Refined, 48 p. c. 1.50@1.55
Refined, 58° 1.40@1.45

Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1¾@2
Lump. ℔ ton. Liverpool £4 17 6
Sulphate of Alumina, ℔ ton. £4 10

Aqua Ammonia—18°, ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammonia—Sul., ℔ 100 lbs. 3.15
Carb., per lb. 7½@8½

Arsenic—White, powdered, ℔ lb. 3¼@3½
Red. ℔ lb 5¾@6¾
White, at Plymouth, ℔ ton. £12 2 6d.

Asbestos—Am., p. ton $50@$300
Italian, p. ton, c. i. f. L'pool £18@£60

Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5½c
Hard Cuban, ℔ ton. $28.00
Trinidad, refined, ℔ ton. $30.00

Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, p. ton 19½@21.50
Sulph., off color, p. ton 11.50@14.00
Carb., lump, f.o.b. L'pool, ton £6
No. 1, casks, Runcorn " £4 10 0
No 2, bags, Runcorn " " 3 15 0

Bleach—Over 35 p.c., ℔ lb. 1.70@1.75

Borax—Refined, ℔ lb. 9½@9⅝
Concentrated 7¾@8⅝
Refined at Liverpool, ℔ ton. £29

Brimstone—*See Sulphur.*

Bromine—℔ lb. 37@38

Chalk—℔ ton. 1.75
Precipitated, ℔ lb. 4¾@5

China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton. 13.50

Chrome Yellow—℔ lb. 10@25

Cobalt—Oxide, ℔ lb. 2.60@2.90

Copper—Sulph. English Wks, ton £20@£21

Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.

Cream of Tartar—Am. 99% 22½
Powdered, 99 p. c. 23

Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb 3¾@3½

Feldspar—Ground, ℔ ton. 15.00

Fuller's Earth—Lump, ℔ bbl. .90@.95
Powdered, ℔ lb. 1⅞@2

Gypsum—Calcined, ℔ bbl. 1.25@1.50

Iodine—Resublimed 2.75

Kainit—℔ ton 10.00

Kaolin—*See China Clay.*

Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb 8½@8¾
Acetate, or sugar of, white 12@13

Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½

Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½

Magnesite—Greek, ℔ ton. 20.00

Manganese—Crude, per unit .23@.28
Oxide, ground, per lb. 2¼@6½

Mercuric-Chloride—(*Corrosive Sublimate*), ℔ lb. 70@72

Mineral Wool—℔ lb. 2

Mica—In sheets according to size, 1st quality, ℔ lb. .25@$6 00

Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston 5.75@7.00
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00

Phosphorus—℔ lb. 70@75

Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

Potassium—Cyanide, ℔ lb. .39@40
Bromide, ℔ lb. 33
Chlorate, ℔ lb. 13@10
Carb. ℔ lb. 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide 2.65@2.70
Muriate, ℔ 100 lbs. 1.80
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 10½@11
Sulphate, ℔ 100 lbs. 2.30@2 35
Yellow Prussiate, ℔ lb. 17½@18
Red Prussiate, ℔ lb. 42@45

Pumice Stone—Select lumps, lb. 3½
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2½

Pyrites—Non-cupreous, p. units 10d

Quartz—Ground, ℔ ton. 14.00@16.00

Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb 6@10

Salt—Liverpool, ground ℔ sack. 75@80
Turk's Island, ℔ bush. 25@28

Salt Cake—℔ lb. 60@62½

Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8

Soda Ash—Carb., 48 % 100 ℔. 1.45
Caustic, 48 % 1.30
Soda Caustic, 60% 2.50
" " 70% 2.27½@2.35
" " 74-0% 2.27½@2.35
Sal, English, ℔ 100 lbs. 1.00
Sal, American, ℔ 100 lbs .90
Nitrate. 100 lbs. 1.90@1.95

Strontium—Nitrate ℔ lb. 9@9¼

Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton. 19.50
Crude Brimstone, 3ds, ℔ ton, 19.00

Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton. £4 5

Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85

Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb 7

Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb. 6¼@7
* Spot

THE RARER METALS.

Aluminum—(Metallic), ℔ lb. $2.@$2.50
Sheet, per lb. 2.50

Arsenic—(Metallic), per lb. .40

Barium—(Metallic), per gram $4.00

Bismuth—(Metallic), per lb. 2.75

Cadmium—(Metallic), per lb 1.00

Calcium—(Metallic), per gram 10.00

Cerium—(Metallic), per gram 7.50

Chromium—(Metallic), per gram 1.00

Cobalt—(Metallic), per lb. 6.00

Didymium—(Metallic), per gram 9.00

Erbium—(Metallic), per gram 7.50

Gallium—(Metallic), per gram 140.00

Glucinum—(Metallic) per gram. 12.00

Indium—(Metallic), per gram. 9.00

Iridium—(Metallic), per oz. 7.00

Lanthanum—(Metallic), per gr. 10.00

Lithium—(Metallic), per gram. 10.00

Magnesium—Per lb. 4.50

Manganese—Metallic, per lb. 1.10
Chem. pure, per oz. 10.00

Molybdenum—(Metallic), per gm. .50

Niobium—(Metallic), per gram. 5.00

Osmium—(Metallic), per oz 65.00

Palladium—(Metallic), per oz. 35.00

Platinum—(Metallic), per oz. 9.00

Potassium—Metallic, per lb. 28.00

Rhodium—(Metallic), per gram. 5.00

Ruthenium—(Metallic), per gm. 5.50

Rubidium—(Metallic), per gram 2.00

Selenium—(Metallic), per oz. 1.80

Sodium—(Metallic) per lb. 2.50

Strontium (Metallic), per gm. .60

Tantallum—(Metallic) per gram 9.00

Telurium—(Metallic) per lb. 5.00

Thallium—(Metallic) per gram .25

Titanium—(Metallic) per gram. 2.25

Thorium—(Metallic) per gram. 17.00

Tungsten—(Metallic) per oz. 2.25

Uranium—(Metallic), per lb. 5.00

Vanadium—(Metallic), per gm. 22.00

Yttrium—(Metallic), per gram. 9.00

Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 3 25@3.50
Jerseys, ℔ 1,000 5.50@6 50
Up Rivers, ℔ 1000 6 00@6.50
Haverstraw seconds, ℔ 1000 6.25@6.50
Haverstraw firsts ℔ 1,000 6.50@7.00
Fronts, nominal, ℔ 1000.
Croton 14.00@16.00
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore

Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu.ft 45@1.25
Granite, Scotch ℔ cu ft. 1.00@1.15

Cement—Rosendale, ℔ bbl .85@1.10
Portland, American, ℔ bbl. 2 15@2.45
Portland, foreign, ℔ bbl. 2.30@2.40
Portland, " special brands. 2.45@2.75
Roman, ℔ bbl. 2.65@2.85
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.00@8.25

Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black, roofing, ℔ 100 sq. ft. 4.25@5.50

Lime—Rockland, common ℔ bbl. 1.00
Rockland, finishing, ℔ bbl. 1.20
St. John, com. and finish, ℔ bbl. .90@.95
Glens Falls, com. and fin., ℔ bbl .85@1.10

Labor—Ordinary, ℔ day 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2.50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4 00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.

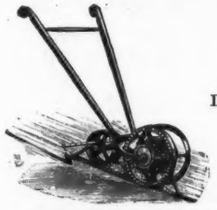
NEW YORK PRICES CURRENT.
APRIL 5, 1890.

Discounts are for Export Only.

In the interest of the extension of the markets for American manufactures the ENGINEERING AND MINING JOURNAL has secured the services of gentlemen thoroughly acquainted with the export trade and with foreign markets, and it offers its services to foreign buyers who may desire information concerning any article whatever of American manufacture. No charge will be made for these services, either directly or indirectly through commissions on goods purchased. The proprietors of the ENGINEERING AND MINING JOURNAL are neither commission merchants nor exporters, but they have many sources of information, both at home and in foreign countries, and place these at the service of manufacturers and exporters here and of importers and consumers in other countries.

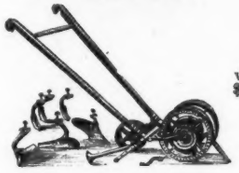
Agricultural Implements.

S. L. ALLEN & Co.



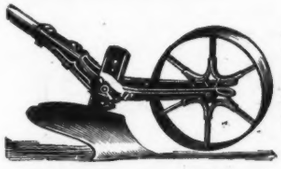
"Planet, Jr." No. 2 Seed Drill, $9.

Dis. 30%.



Combined Drill Cultivator Rake, Plow, etc., $12.

Dis. 30%.

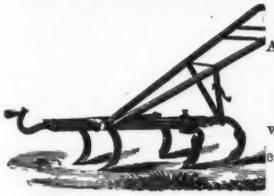


"Fire Fly" single-wheel Hoe, Cultivator and Plow, $5.

"Fire Fly" Hand Plow, $2.50.

30 % discount, f.o.b. New York.

All Steel Horse Hoe and Cultivator combined, with wheel, $6 75-100 net.



All Steel Plain Cultivator.

With wheel, $4.50; without wheel, 60c. less.

HAY FORKS.

Gold Finish, Patent Overcaps.

Three Tine Forks.

No.	Tine.	Handles.	Per doz.
30	10 in.	4½ ft.	Boy's $7.75
32	12 "	4 to 6 ft.	..... 9.00
32 S	12 "	"	Strapped.... 10.50
32 B	12 "	"	Bent..... 9.50
32 B S	12 "	"	Bent & St'pd 11.00
33	12 "	"	..... 9.50
33 S	13 "	"	Strapped.... 11.00
33 B	13 "	"	Bent..... 10 00
33 B S	13 "	"	Bent & St'pd 11.50
34	14 "	"	..... 10.25
34 B	14 "	"	Bent..... 10.75
35	15 "	"	..... 11.25
35 B	15 "	"	Bent..... 11.75
42 B	12 "	"	Bent..... 12.50
42 B S	12 "	"	Bent & St'pd 14.00

Manure Forks, Solid Steel Shanks, Gold Bronze Finish, Patent Overcaps.

No. 44, oval, 4 tine, 12 in. tine, 4 ft. handle, plain ferrules, $12.50 per doz.

No. 44 S, oval, 4 tine, 12 in. tine, 4 ft. handle, strapped ferrules, $14.

No. 44½, oval, 4 tine, 12 in. tine, 4½ ft. handle, plain ferrules, $12.50.

No. 44½ S, oval, 4 tine, 12 ft. tine, 4½ ft. handle, strapped ferrules, $14.

No. 54, oval, 5 tine, 13 in. tine, 4 ft. handle, plain ferrules, $19.50.

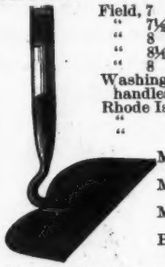
No. 54 S, oval, 5 tine, 13 in. tine, 4 ft. handle, strapped ferrules, $21.

No 64, oval, 6 tine, 13 in. tine, 4 ft. handle, plain ferrules, $22.50.

No. 64 S, oval, 6 tine 13 in. tine, 4 ft. handle, strapped ferrules, $24.

HOES.

Ely Standard Socket, all Gold Bronze Neck, full Pol'd, C. S. Blade.



Field, 7	× 5	in., selected handles.. $9.00
" 7½	× 4½	" " " .. 9.00
" 8	× 4¾	" " " .. 9.00
" 8½	× 4½	" " " .. 9.00
" 8	× 5	" " " .. 9.00

Washington County Pattern, spring handles..... 10.00

Rhode Island, 7 to 9 in., spr'g handles 9.00

" " 9½ in. " " 9.25

" " 10 " " " 9.50

Meadow, 9 × 4 in., poplar handles..... 9.00

Meadow, 9½ × 3½ in., poplar handles..... 9.25

Meadow, 10 × 3½ in., poplar handles..... 9.50

Broom Corn, 7½ × 4½ in., poplar handles..... 9.00

Popular Handles in Meadow Socket Hoes, unless otherwise ordered.

PLOWS.

Reversible Oneonta Clipper.

16. Oneonta Clipper, Reversible, Iron beam Cutter..... $14

" Oneonta Clipper, Reversible, Iron Wheel and Cutter..... 15

18. Oneonta Clipper, Reversible, Iron Beam Cutter..... 15

" Oneonta Clipper, Reversible, Iron Beam, Wheel and Cutter..... 16

17. Hard Metal, Reversible, Iron Beam Cutter..... 17

17. Hard Metal, Reversible, Iron Beam, Wheel and Jointer..... 17

19. Hard Metal, Reversible, Wood Beam Cutter..... 16

" " " " " " Wheel and Jointer..... 17

20. Steel Mould Board, Reversible, Wood Beam Cutter 15

" " " " " " Wheel and Cutter..... 16

Iron Beam Plows.

Two-horse Sod and Stony Land.... 8.50 plain.

Curtis's Sod Two horse..... 11.50 "

" " " " ..... 13.00 cutter.

" " " " ..... 14.25 wheel & cutter.

Subsoil Plows.

Two-horse 9.50 Draft Rod.

" " 11.00 Wheel and Draft Rod.

Hitchcock's Potato Digger and Shovel Plow.

Improved adjustable handle shovel plow..... 7.00

Hitchcock's Potato Digger..... 8.00

" " and shovel plow..... 10.50

Dis. 30%.

RAKES.

The S. R. Nye Improved.

22 Teeth Rake, $32.00

26 " " 34.00

25% dis.

Chieftain Lock Lever

No. 1..... $30.00

No. 2. ..... 30.00

No. 5..... 29.00

Iron wheels, $2 extra. With Pole, Double Tree and Neck Yoke, $2 extra.

22 cubic feet packed, 400 lbs. gro., 225 lbs. net.

Golden Farmer Self-Dumping Rake, $37.00; 22 cu. ft., 430 lbs. gro., 250 lbs. net.

Chieftain Hay Tedders, $59.00; 700 lbs. gro., 450 lbs. net.

Potato Diggers, $7.00; 100 lbs. gro., 60 lbs. net: dis., 40% f.o.b. ship New York or Boston.

RAKES (GARDEN).

Braced steel garden rakes. Per doz

8 teeth	$8.00
10 "	9.00
12 "	10.00
14 "	11.00
16 "	12.00

Braced malleable garden rakes.

10 teeth	$5.50
12 "	6.00
14 "	6.50
16 "	7.00

Ten-Teeth Malleable Garden.	Plain.	Braced.	Steel Garden. Plain.	Braced.
10-Teeth	$5.50	$6.00	$9.00	$10.50
12 "	6.00	6.50	10.00	11.50
14 "	6.50	7.00	11.00	12.50
16 "	7.00	7.50	12.00	13.50

Dis. 70 and 5%.

Cast steel garden rakes.

	Per doz.
10 teeth, polished, tapering bar, tempered rake.	$9.00
12 " " " " " "	10.00
14 " " " " " "	11.00
16 " " " " " "	12.00

Cast steel lawn rakes.

12 teeth, polished, tapering bar, tempered rake	$10.00
14 teeth polished tapering bar, tempered rake	11.00
16 teeth polished tapering bar, tempered rake	12.00
18 teeth polished tapering bar, tempered rake	13.00

Dis. 70% from Standard Association list.

Prices made where XX handles, etc., are required.

SCYTHES (GRASS).

Waldron's pattern, oiled	$8.50
Silver steel, painted	8.50
Western dutchman, bronzed and painted	9.00
Clipper, polished web	9.00
Fine cutlery steel, full polished	10.00
All steel, full polished	11.00

Grain Scythes.

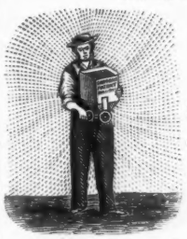
Waldron's pattern, oiled	11.25
Silver steel, painted	11.25
Clover, oiled	11.25
Clipper, bronzed and painted	11.50

Lawn Scythes.

Clipper, bronzed and painted	9.00

Dis., 40 and 10%.

SOWER, BROADCAST SEED.



Goodell & Co.

Per dozen..... $36 f.o.b.

Gross wt., 110 pounds per dozen

Net wt., 75 pounds per dozen.

Anvils.

"Eagle anvils.

	Weight about			Weight about	
No. 000	½ lb	$1 00	No. 4	40 lbs	$4.25
" 00	4 "	1.70	" 5	50 "	5.05
" 0	10 "	2.20	" 6	60 "	5.50
" 1	15 "	2.75	" 7	70 "	6.00
" 2	20 "	3.00	" 8	80 "	7.00
" 3	30 "	3.75	" 9	90 "	8.00

Anvils weighing 100 to 800 lbs., 10 cts. per lb. Discount 20 and 10 %.

Arms and Ammunition.

Wood Powder.

American Wood Powder Company.

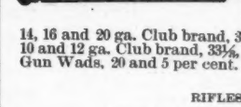
¼ kegs.

	Kegs, 25 lbs.	6¼ lbs.	1 lb. cans.
Trap for first quality arms only	$19.50	5.00	.85
A, for large bore. C, for general use. D, fine for small bore and rifles.	17.00	4.35	.75
E, very fine for small bore rifles and gallery shooting			

	Discount. Per cent.	
Bullet Breech Caps. per lb.	1.60	10
Conical Bullet Caps. "	1.75	10

	Discount. Per cent.	
Rim Fire Cartridges	60	10
Military Rim Fire Cartridges	15	10
Central Fire Pistol and Rifle Cartridges	40	10
Central Fire Metallic Cartridges for Target and Sporting Rifles	30	10
Military Cartridges, Central Fire	30	10
Lefaucheux Cartridges		60

		Special
Gatling Cartridges		
Primed Shells and Bullets	25	10
Friction Cannon Primers	20	10
Primers		10
Percussion Caps, F. G per M.	33c.	
U. M. C. "	42½c.	
Musket "	45c.	
Brass Shot Shells, U. M. C., 1st qual	60	10
Club brand	65	10



Paper Shot Shells.

14, 16 and 20 ga. First quality, 30, 10 and 10 per cent; 4, 8, 10 and 12 ga., First quality, 25, 10 and 10 per cent.

14, 16 and 20 ga. Club brand, 30, 10 and 10 per cent.

10 and 12 ga. Club brand, 33⅓, 10 and 10 per cent.

Gun Wads, 20 and 5 per cent.

RIFLES.

Colts' Lightning Magazine.

			Discount 10 per cent
40/60 and 45/60 calibre	octagon barrel	10 lbs.	$15.38
" " " "	round "	9¾ "	14.25
" " " "	carbine "	9 "	14.25
32, 38, and 44 calibres,	octagon "	7¼ "	13.50
" " " "	round "	6¾ "	12.38
" " " "	carbine "	6¼ "	12.38
" " " "	baby carbine "	5¼ "	12.38
22 calibre, rim fire,	octagon barrel		15.38
" " "	round		14.25

Remington Light (Baby) carbines, 44 cal., nick.. $7.50.

MARLIN RIFLE. MODEL, 1889.

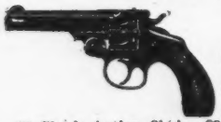
The best in the market, embodying all latest improvements.

38 and 44 calibres, using the same cartridges as Winchester rifles of the respective sizes.

octagon barrel,	24	inch,	6½	lbs. $19.50
"	26	"	6¾	" 21.50
"	28	"	7	" 23.50
Round "	24	"	6½	" 18.50
Carbine	20	"	5½	" 17.50

Discount, 25, 10 and 10%.

REVOLVERS.
Smith & Weston



32, Single Action, 3, 3½ in., $8.00.
32, Double Action, 3, 3½ in., $9.35.
32, Safety Hammerless, 3, 3½ in., $11.00.
38, Single Action, 3¼ in., $9.40; 38, Single Action, 4 in., $9.65; 38, Single Action, 5 in., $10.00; 38, Double Action, 3¼ in., $10.40; 38, Double Action, 4 in., $10.65; 38, Double Action, 5 in., $11.00; 38, Safety Hammerless, 3¼ in., $12.00; 38, Safety Hammerless, 4 in., $12.25; 38, Safety Hammerless, 5 in., $12.50; 44, Single Action, 4 in., $11.50; 44, Single Action, 5 in., $11.75; 44, Single Action, 6, 6½ in., $12.00; 44, Double Action, 4 in., $12.50; 44, Double Action, 5 in., $12.75; 44, Double Action, 6½ in., $13.00; 44, Double Action Favorite, 5 in., $12.75.

Colts.

Discount, 10 per cent from following prices.

Double Action Army, 44 and 45 calibre, 4¾, 5½, 7½ inch bbl., $13.00.
Double Action, 41 calibre, 2½ to 6 inch bbl., $11.20.
" " 38 " 2½ to 6 " " $10.00.
Single " Army, 45 calibre, 4¾, 5½, and 7½ inch bbl., $12.00.
Single Action Army, 44 calibre, "Frontier," 4¾, 5½, and 7½ inch bbl., $12.00.
New Line, 41 calibre, blued or nickeled, $4.00.
" " 32 " " " 4.00.
" " 30 " " " 2.00.
" " 22 " half or full plate, 2.10.
Old Model, 22 calibre, by the hundred, half or full plate, $1.50.
Colt Deringer. 41 calibre, per pair half or full plate, $5.50.

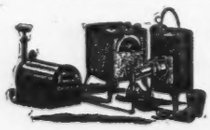
American Bull Dog

Double Action 32, 38 and 44 calibre, 2½ inch barrel, $1.60; Double Action 32, 38 and 44 calibre, 4¼ inch barrel, $1.85; Double Action 32, 38 and 44 calibre, 6 inch barrel, $2.10.

F. & W. British Bull Dog revolvers, 32 and 38 calibre 2½ inch bbl., $1.80.
F. & W. Automatic revolver, 32 and 38 calibre, 3¼ inch bbl. $5.50.
H. & R. Automatic revolver, 32 and 38 calibre, 3¼ inch bbl., $4.75.
Defender revolvers, Single Action, 22, wood handle, 65.
" " " " 22, rubber " 70.
" " " " 32, wood " 85.
" " " " 32, rubber " 90.
Remington Army revolver, Single Action, 44 cal., frontier cartridge, 5¾ inch barrel, $6.50.
Remington Army revolver, Single Action, 44 cal., frontier cartridge, 7½ inch barrel, $6.00.
Remington Double Deringers, 41 cal., rim fire, $4.05.
National Deringers, 41 calibre, per pair, half or full plate, $4.00.
New House, 41 or 38 calibre, blued or nickeled, $5.00.
" Police, 38 calibre, 6 in., " " 7.00.
" " 38 " 4½ in., " " 7.00.

Assay Furnace.

Hydro-Carbon Blow-Pipe Assay Furnace.



No. 2, Muffle Furnace taking C Battersea Muffle 8x4¾x3 in. $10.00
No. 3, taking F Muffle, 10x6x4 in. 15.00
No. 1, Crucible Furnace, taking Battersea, U or Colorado B Crucible, 4 in. dia. 5½ deep.. 4.00
No. 2, taking Battersea E, round, 5 in. dia., 6½ deep. 5.00
Blow-Pipe No. 1, with half gallon tank, made of plain, strong sheet metal. 18.00
Blow-Pipe No. 2, with half gallon tank, made entirely of seamless brass. 23.00
Blow-Pipe No. 3, with one gallon tank, otherwise same as No. 2. ..... 26.00
Blow-Pipe No. 1, Muffle Furnace No. 2, and Crucible Furnace No. 1. ..... 32.00
Blow-Pipe No. 2, Muffle Furnace No. 2, and Crucible Furnace No. 1. ..... 37.00

Axes, etc.

Hatchets, Broad Single Bevel.

Collins', cut in., 5, $9.50; 5½, $10.00; 6, $10.50; 6½, $11.00; 7½, $11.50; dis. 10%.

Peck's, cut in., 4, $10.50; 4½, $11.50; 5, $13.00; 5½, $14.50; 6, $16.50; 6½, $18.00; 7½, $19.50; 8¼, $22.00; dis. 45%.

Ryder's, cut in., 5, $13.00; 5½, $14.50; 6, $16.50; 6½, $18.00; 7½, $19.50; dis. 50%.

Shingling Hatchets.

1. 2. 3.

Collins, $4.75, $5.25, $5.75 doz., dis 10%.
Peck's, $8.00, $8.50, $9.00 doz. dis. 45%.
Ryder's, $8, $8.50, $9 doz., dis. 50%.

Claw Hatchets.

1. 2. 3.

Collins', $5.25, $5.75, $6.25 doz., dis. 10%.
Peck's, $9.00, $9.50 $10.00, doz 45%.
Ryder's, $9, $9.50, $10 doz., dis. 10%.

Adzes. House. Ship

	Half flat head. Dozen.	spur poll. Dozen.	Discount. Per cent.
Collins'...	$14.00	$13.00	10
Peck's....	24.00	25.00	45
Ryder's...	24.00	25.00	50

Broad Axes—Pittsburgh Pattern.

5 to 8 pounds, $32.00 dozen.
7 to 9 pounds, $35.00 dozen.
8 to 10 pounds, $38.00 dozen.
9 to 12 pounds, $45.00 dozen.
Western pattern same price.

Spanish Pattern. Detumba round eye, $10.50 per doz.

Spanish Pattern Media labor, $12.25 per dozen.

Axle Grease.

Frazer's (2-lb. tins), per gross	$18.00
2-lb. wooden boxes, "	12.00
Discount, 25 and 5 %.	
Dixon's Everlasting, boxes 1 lb., per doz.	$1.20
" " " 2 lbs., "	2.00

Lovell, Tracy & Co.

English coach axle grease.

Regular wooden boxes per gross, $8.50.

Axleine.

Decorated tin boxes, per gross $12.

Special prices on quantity, and goods in large packages.

See Oils, page 10.

Bellows.

Miner's Bellows: 24 in., $8.50; 26 in., $9.75; 28 in., $11.00; 30 in., $11.25; 32 in., $13.50.
60 and 5% dis.
Standard, each: 18 to 24 in., $10; 28 in., $12; 32 in., $14; 34 in. $16; 36 in., $18; 38 in., $20; 40 in., $23; 44 in., $32.
60 and 5% dis.
Hand Bellows, per doz.: 6 in., plain, $10; fancy, $20; 7 in., plain, $12; fancy, $24; 8 in., plain, $14; fancy, $28; 9 in., plain, $16; fancy, $32; 10 in., plain, $18; fancy, $36.
50% dis.

Belting.

LEATHER BELTS.
Standard Manufacturers List.
Single belts per foot.

Width.		Width.		Width.	
1 inch.	.10	6 inch.	.76	20 inch.	2.84
1¼ "	.13	7 "	.90	21 "	3.02
1½ "	.17	8 "	1.02	22 "	3.20
1¾ "	.20	9 "	1.15	23 "	3.37
2 "	.23	10 "	1.29	24 "	3.54
2¼ "	.26	11 "	1.42	26 "	3.92
2½ "	.30	12 "	1.55	28 "	4.30
2¾ "	.33	13 "	1.68	30 "	4.64
3 "	.36	14 "	1.82	32 "	5.00
3½ "	.43	15 "	1.98	34 "	5.35
4 "	.50	16 "	2.14	36 "	5.70
4½ "	.56	17 "	2.31	40 "	6.40
5 "	.63	18 "	2.49	44 "	7.10
5½ "	.70	19 "	2.66	48 "	7.80

Double belts twice the price of single.
Dis. single and double belts, cemented, 50 and 5%.
Dis. single and double belts, riveted and cemented, 50 and 5%.
Dis. single belts, cemented and lacesewn, water proofed, 50%.
Dis. double belts, cemented and lacesewn, water proofed, 45%.

See Rubber Belting, page 7.
See Link Belting, page 9.

Brick Machinery.

WELLINGTON MACHINE CO.

Heavy Steam Power Machine	$525.00
Horse-Power Machines	300.00
Additional Horizontal Pugmill	225.00
Brick Moulds	$2.50 to $3.00
Brick Trucks	5.00 to 13.50
Brick Barrows	7.25
Brick Barrows with Springs	8.2
Sand Barrows, steel tray	6.5

Burglar Alarm.

Tommins & Adams.

SAFETY AUTOMATIC BURGLAR ALARM AND DOOR FASTENER.

REQUIRES NO WINDING UP.

Per doz., $24. Dis., 40%.

The slightest push on the door explodes two caps in succession and rings alarm bell.

Carriages, Etc.

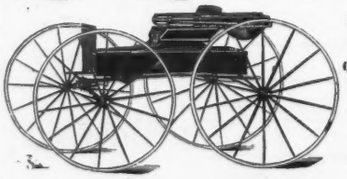
D. F. Sargent & Son.

No. 0. Cart, top and fenders	$150
No. 1. Cart, top and fenders	90
No. 2. Cart, one man cart, open	65
No. 2. Cart, one man, top.	86
No. 2. Cart, one man, top and fenders	90
No. 3. Cart, two man, open	60
No. 3-H. Cart, two man, open	54
No. 4. Cart, two man, top.	86
No. 5. Cart, two man, top and fenders	90
No. 6. Cart, two man, top and fenders	90
No. 7. Two-man combination cart	110

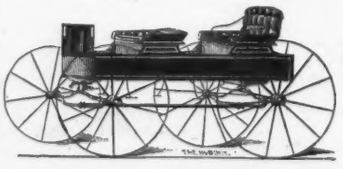
Wide track 5 feet.
Narrow track 4 feet 8 inches.
Discount 33⅓ per cent. off.

Windsor Surrey.
Open, $150.
Canopy top, $180.
Leather extension top, $210
Pole or shafts.

Cut under Surrey.
Canopy top, $185.
Leather extension top, $220.



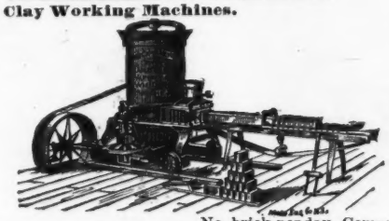
Brewster Spring.
Open, $65.
Rubber top, $80.
Leather top, $110.



Runabout, $65.

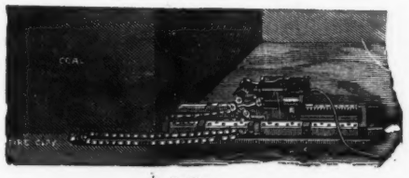
Buckboard. $30 ; shafts.

Clay Working Machines.



	No. brick per day.	Complete.
No. 10 D brick machine	50,000	$1,500
No. 10 S " "	30,000	1,200
No. 4 " "	40,000	1,100
No. 7 S " "	20,000	650
No. 6 S " "	15,000	575
No. 2 E. H. P. "	6,000	3,365

Coal Mining Machine.



Jeffrey.

6 feet undercut.....$1500 | 5 feet undercut.....$1400

Jeffrey Power Coal Drills.

Air feed drill.....$275 | Screw feed drill.....$200

Discount, 10%.

Crucibles. E. H. Sargent & Co.

Battersea Crucibles, Triangular.

No.	Height. Inches.	Width. Inches.	Crucibles. Per doz.	Covers. Per doz.
S	4½	4⅛	$1.00	$0.50
T	4	3⅝	0.80	0.50
U	3½	3¼	0.60	0.40
V	3¼	2⅞	0.45	0.40
W	2⅞	2⅝	0.35	0.30
X	2½	2¼	0.30	0.30
Y	2⅛	2¼	0.25	0.30
Z	1¾	1¾	0.20	0.30

Battersea Muffles, any size, made to order.
See Illustration in advertisement.

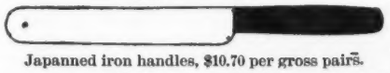
No.	Long. Inches.	Wide. Inches.	High. Inches.	Price. Each.
A	7	3⅛	2½	$ .60
B	7½	4⅜	2⅞	.75
C	8	4¾	3	.85
D	8½	5	3¼	1.00
E	9	5½	3⅝	1.15
F	10	6	4	1.25
G	11	4	3½	1.00
H	10½	5¼	3⅞	1.00
J	12	6	4	1.25
K	14	8	5	1.75
L	15	9	6	2.00

Export discount 15 %.

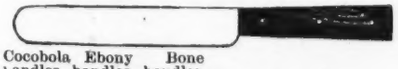
Cutlery.

(Tommins & Adams.)

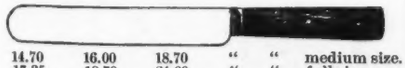
KNIVES—TABLE.



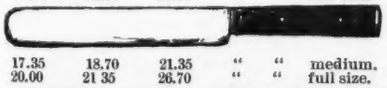
Japanned iron handles, $10.70 per gross pairs.



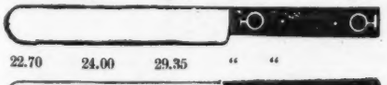
Cocobola handles. 10.70 | Ebony handles. 12.00 | Bone handles. 15.35 gross pairs.



14.70 | 16.00 | 18.70 " " medium size.
17.35 | 18.70 | 24.00 " " full size.



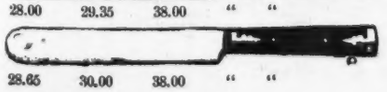
17.35 | 18.70 | 21.35 " " medium.
20.00 | 21 35 | 26.70 " " full size.



22.70 | 24.00 | 29.35 " "

27.35 | 28.70 | 36.00
Cocobola handles. | Ebony handles. | Bone handles. gross pairs.

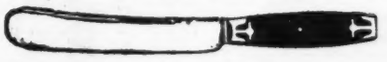
28.00 | 29.35 | 38.00 " "



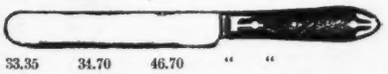
28.65 | 30.00 | 38.00 " "

28.65 | 30.00 | 38.00 " "

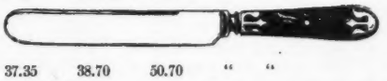
32.00 | 33.35 | 38.00 gross pairs.



34.70 | 36.00 | 48.00 " "

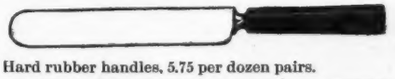


33.35 | 34.70 | 46.70 " "

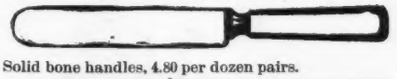


37.35 | 38.70 | 50.70 " "

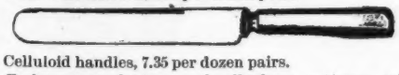
40.00 | 41.35 | 53.35 " "



Hard rubber handles, 5.75 per dozen pairs.



Solid bone handles, 4.80 per dozen pairs.



Celluloid handles, 7.35 per dozen pairs.

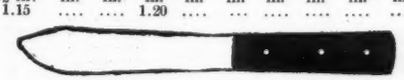
Forks are made to match all above patterns, with either three or four prongs.

Discount 25 %.

BUTCHERS'—COCOBOLA HANDLES.

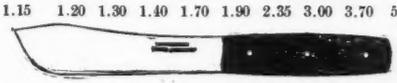
Per dozen.

4 and 4½ in.	5 in.	5½ in.	6 in.	6½ in.	7 in.	8 in.	9 in.	10 in.	12 in.
1.15	....	....	1.20	....	....	....	....	....	....

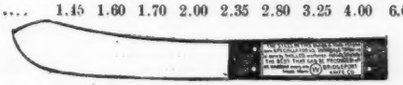


1.40 ... . 1.50 ....

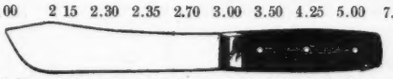
1.15 1.20 1.30 1.40 1.70 1.90 2.35 3.00 3.70 5.35



.... 1.45 1.60 1.70 2.00 2.35 2.80 3.25 4.00 6.00



2.00 2 15 2.30 2.35 2.70 3.00 3.50 4.25 5.00 7.50

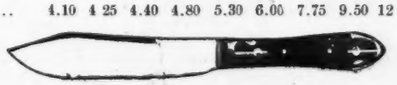


2.45 2.70 2.95 3.15 3.45 3.70 4.35 5.00 6.00

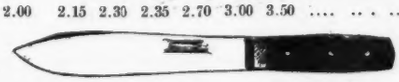
2.10 2.20 2.35 2.50 2.80 3.40 4.35 5.30 6.85 ...

3.40 3.55 3.70 4.10 4.60 5.30 7.00 8.75 11.

.... 4.10 4 25 4.40 4.80 5.30 6.00 7.75 9.50 12 .5



2.00 2.15 2.30 2.35 2.70 3.00 3.50 ....



Discount 25 and 10 %.

HUNTING—EBONY HANDLES.

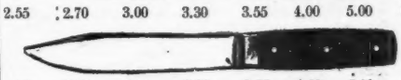
5½ in. | 6 in. | 6½ in. | 7 in. | 8 in. | 9 in. | 10 in

Per Dozen.

2.00 2.20 2.35 .75 3.00 3.60 4.30 5.2

2.10 2.20 2.35 2.75 3.00 3.60 4.30 5.2

2.55 2.70 3.00 3.30 3.55 4.00 5.00 6.00



.55 2.70 3.00 3.30 3.55 4.00 5.00 6.00

Discount, 25 and 10 %.

Per Dozen.

Putty knives, cocobola handles..... ..... $1.30@$1.50

SHEARS.

TAILORS'—JAPANNED OR NICKEL HANDLES.

Per pair.

12 in.	6.00		
12½ in.	7.00		
13 in.	8.00		
13½ in.	9.00		
14 in.	10.00		
14½ in.	11.00		
in	12.00	16 in.	14.00

Discount, japanned, 60 %; nickle, 45 %.

BENT TRIMMERS.

Per dozen.

6 in.	13.00	10 in.	27.00
7 in.	15.00	11 in.	30.00
8 in.	17.00	12 in.	33.00
9 in.	22.00		

STRAIGHT TRIMMERS.

Per dozen,

6 in.	12.00	10 in.	25.00
7 in.	14.00	11 in.	30.00
8 in.	16.00	12 in.	33.00
9 in.	19.00		

LADIES' SCISSORS.

Per dozen.

4½ in.	10.00	6 in.	11.00
5 in.	10.00	6½ in.	12.00
5½ in.	10.50	7 in.	13.00

PAPER AND BANKERS'.

Per dozen.

9 in.	18.00	13 in.	36.00
10 in.	25.00	14 in.	42.00
11 in.	27.00	16 in.	54.00
12 in.	32.00	18 in.	20.00

BARBERS—Per dozen.

7½ in.	15.00	9 in.	18.00
8 in.	16.00	9½ in.	20.00
8½ in	17.00		

SCISSORS.

BUTTON-HOLE.

5 and 5½in., 14 00 per dozen.

Discount, japanned, 70 and 10 % nickel, 60 and 10 %

PRUNING.

1 B., 9 in., 24 per dozen; 2 B. 8½ in., 21; 3 B., 7¾ in., 9.80.

No. 1 10, 10 in., $30 per doz.

PRUNING SHEARS FOR LONG HANDLES.

No. 1, $36 per dozen; No. 2, $30 per dozen.

Discount, 35%.

SPOONS, FORKS, ETC., BEST PLATE ON HARD WHITE METAL

Tipped Tea Spoon.

Oval Tea Spoon.

Perfect Tea Spoon.

Leader Tea Spoon.

	5 oz. or extra plate — Tipd	Oval.	Perfect and Leader.
Tea spoons	4.25	4.50	4.75 per doz.
Dessert spoons	7.50	8.00	8.50 " "
Table spoons	8.50	9.00	9.50 " "
Coffee spoons	4.25	4.50	4.75 " "
Dessert forks	7.50	8.00	8.50 " "
Medium forks	8.50	9.00	9.50 " "

Discount, 60 and 5%.

Spoons and forks, German silver, tipped pattern.

Tea spoons.	Table spoons.	Medium forks.
22.50	45.00	45.00 per gross.

Discount, 60 %.

Spoons and forks, made from brass, and silver plated on a coating of hard, white nickel.

Aesthetic medium fork.

Tea spoons.	Table spoons.	Medium forks.
7.50	15.00	15.00 per gross.

Discount, 30 and 5 %.

Children's sets *on cards*.	3 pcs.	4 pcs.	
Leader pattern, as per cut....	21.00	24.00 doz.	60 and 5 %
Aesthetic pattern, as per cut..	5.75	7.25 doz.	30 and 5 %

Cutters.

FEED.

No. of cutter.	No. of knives.	Length in inches of knives.	Length in inches of feed cut.	Price.
1	2	6¼	½, ¾ and 1⅛	$18 00
2	2	7¼	½, ¾ and 1⅛	21.00
2½	1	7¼	⅝, ⅞, 1¼ and 1⅝	21.00
2½	2	7¼	⅜, ½, ⅝ and ⅞	23 00
3	1	8½	⅝, ⅞, 1¼ and 1⅝	25.00
3	2	8½	⅜, ½, ⅝ and ⅞	27.00
4	1	10	⅝, ⅞, 1¼ and 1⅝	30.00
4	2	10	⅜, ½, ⅝ and ⅞	33.00
5	2	10	½, ⅝, ⅞ and 1¼	35.00
6	2	11	½, ¾, 1¼ and 2	45.00
6½	2	11	½, ¾, 1¼ and 2	45.00
7	2	13	½, ¾, 1¼ and 2	60.00
7½	2	13	½, ¾, 1¼ and 2	60.00
10	2	16	½, ¾, 1¼ and 2	80.00
12	2	20	½, ¾, 1¼ and 2	100.00
11	2	11	½, ¾, 1¼ and 2	45.00
13	2	13	½, ¾, 1¼ and 2	60.00
16	2	16	½, ¾, 1¼ and 2	80.00
20	2	20	½, ¾, 1¼ and 2	100.00

The knife arbors for all sizes are made of machinery steel. 30 per cent. dis.

VEGETABLE—GALE'S.

Size.	Weight of Fly Wheel. Pounds.	Will cut per hour. Pounds.	Price
No. 1½	20	1,500	$12
No. 2½	32	1,700	15
No. 3½	32	1,700	15
No. 4	42	2,000	18
No. 5	50	3,000	25
No. 10	65	8,000	35

30% dis.

Drill—Portable Hand Rock.

Price, $225.

Dis., 20%.

Duck and Twine.

22-inch, Hard, Medium and Soft.

	Weight per yd.	Cents, per yd.		Weight per yd.	Cents, per yd.
No. 0...	19 oz.	35	No. 6...	13 oz.	26
1...	18 "	33	7...	12 "	25
2...	17 "	32	8...	11 "	23
3...	16 "	30	9...	10 "	21
4...	15 "	28	10...	9 "	20
5...	14 "	27			

Ravens, 28½-inch.—Eight ounce, 15 cents per yard Ten ounce, 19 cents per yard; twelve ounce, 22 cents per yard; Fifteen ounce, 27 cents per yard. Dis. 25 and 1%.

Cotton Sail Twine.—Three-fold and upward, 17 to 20 cents per pound. Dis. 3%.

Electroplate.—Babcock & Co.'s.
Dis. 60 and 2%.

CASTERS.

1,200—Dinner

232—Breakfast.

Dinner Casters.

No. 1,200. 17⅛ in. high, $8.00, quadruple plate.
No. 80. 17 in., $6.00, quadruple plate.
No. 140. 16 in., $7.50, " "
No. 830. 16 in., $5.00, " " Plain, 50 cents less.

No. 25. 16 in., $4.00, double plate.
No. 33. 16 in., $3.75, " "
No. 53. 15 in., $3.00, " "
No. 15½. 14½ in., $2.00, single plate.
No. 19. 14½ in., $1.85, " "
No. 40. 14 in., $1.75, " "

FLAT WARE.

Calla Lily, Empress, Windsor and Olive Patterns, 18 Per Cent Nickel Silver Base.

	Extra plate, per doz.	Double plate, per doz.	Triple plate, per doz.
Tea spoons	$4.75	$6.00	$7.25
Dessert spoons	8.50	10.50	12.50
Table spoons	9.50	12.50	14.50
French coffee spoons	4.75	6.00	7.25
Berry or nut spoons	24.00	30.00	36.00
Bar spoons, small	4.75	6.00	7.25
Dessert forks	8.50	10.50	12.50
Medium forks	9.50	12.00	14.50
Oyster forks	7.00	9.00	11.00
Sugar shells	9.00	11.00	13.00
Sugar tongs	25.50	31.50	37.50
Butter knives, twist or reversed handles	10.50	12.50	14.50
Nut picks	4.75	6.00	7.25
Pie knives, engraved blades	42.00	51.00	60.00
Soup ladles	48.00	60.00	72.00

PICKLE DISHES

No. 146.

No. 144. 12 in. high, $3.50
No. 66. 10½ in. high, $2; assorted colored glass.
No. 155. 12 in. high, $4; assorted colored glass.
No. 146. 12½ in. high, $9; hand decorated glass.
No. 156. 12½ in. high, $6; hand decorated glass.

No. 255.

TEA SETS.

No. 255. 6 pieces, $35, quadruple plate.
No. 301. 4 pieces, $23, quadruple plate.
No. 1847. 6 pieces, $42, quadruple plate.

Explosives.

Ætna Powder Company.

Dynamite, 75%	Nitro-Glycerine, per lb	.32
" 60%	" " "	.25
" 40%	" " "	.20
Blasting powder A, per keg 25 lbs		$2.40
" " B, " " "		1.90
Sporting powder, standard brands, per keg 25 lbs		5.00
" " " " "	12½ lbs.	2.75
" " " " "	6¼ lbs.	1.50
" " high grades "	6¼ lbs.	3.00
" " " per can	1 lb	.60
" " fancy brands "	1 lb	1.00

Discounts special for quantity.

Safety fuse, cotton, 12 M ft. in case	$2.85 per M ft.
" " single tape, 6 M ft. in case	4.25 " "
" " double tape " "	5.40 " "
" " triple tape " "	6.50 " "

Discount 17½%.

Detonating caps, triple force, 25 M. in case	$5.00 per M.
" " quintuple force, 25 M. in case	7.50 per M.
Electrical exploders, 4 ft. wires	$3.00 per 100
" " 6 "	3.54 "
" " 8 "	4.08 "
" " 10 "	4.62 "

Discount 15%. Long lengths to order.

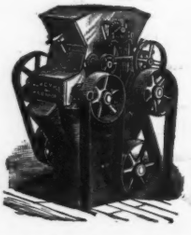
	No.	Capacity.	
Magneto Blasting Machines	1 V.	8 holes	$17.00
" " "	2 V.	20 "	25.00
" " "	3 L.	20 "	25.00
" " "	3 V.	30 "	30.00
" " "	4 V.	60 "	50.00

Discount 15%.

Blasting cables	$5.00 each, discount 40%.
" reels	5.00 " " 20%.

Flouring Mill Machinery.

Nordyke & Marmon Co.



Roller Mills for Wheat Flour.

Prices of Double and Single Roller Mills.

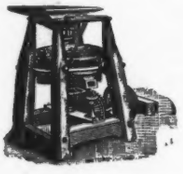
Size.	All smooth.	½ Corrug. ½ smooth.	All corrug.	Single machines. Corrug.	Single machines. Smooth.
6×12	$465	$475	$480	.....	.....
6×16	515	525	530	.....	.....
6×20	565	575	580	.....	.....
7×14	515	525	530	.....	.....
7×18	560	570	575	.....	.....
7×24	635	645	650	.....	.....
9×18	625	640	650	$350	$335
9×24	700	720	735	390	375
9×30	785	810	830	440	420

20-inch New Era Mill for Wheat, Corn, and Middlings.

Size. Inch.	Power. H. P.	Pulley. Inch.	Capacity Bush.
20	4 to 10	14×7	12 to 40

Speed.	Weight. Lbs.	Price.
500 to 800	660	$150

Farm and Plantations Mills.



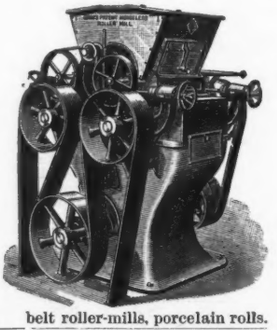
Diameter of burrs.	Power to drive.	Size of pulley.	Capacity per hour.	Revolutions per minute.	Weight.	Price.
	H. P.					
14 in.	2 to 4	9×5½	4 to 14 bushels	600 to 1200	370 lbs.	
18 in.	4 to 10	11×6½	8 to 40 bushels	400 to 700	600 lbs.	

The Dixey Mill—Stiff Spindle Style.

Size.	Power.	Capacity.	Weight. Pulley.	Weight. Geared	Pulley.	Iron gear.	Mortise gear.
18	4 to 6H.P.	8 to 25 bu	560 lbs	650	$130	$165	
22	6 to 8 "	12 to 30 "	800 "	1000	165	200	
26	8 to12 "	16 to 40 "	1100 "	1500	185	220	
30	10 to15 "	25 to 60 "	1300 "	1700	215	255	

Flour Mills.

E. P. Allis & Co.

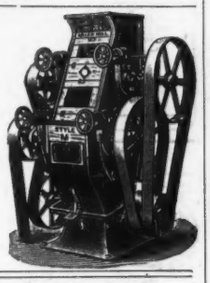


Gray's pat. noise belt roller-mills, porcelain rolls.

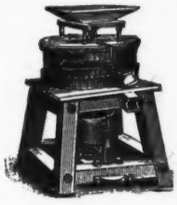
Size of Rolls.	Height.	Length.	Width.	Driving pulley.	Revolutions per minute.	Approximate power required.	Length of driving belt above floor.	Approximate shipping weight.	Price
With corrugated chilled iron rolls.									
14" × 16" single	5' 7"	3' 2"	4"	20" × 6¼"	200 to 300	1¼ to 2¼ H. P.	16' 3"	2,700 lbs.	$600.00
14" × 16" double	5' 10"	3' 6"	4"	20" × 6¾"	200 " 300	1¼ " 4 H. P.	19 3"	4,000 "	800.00
9" × 14"	5' 1½"	3' 10"	3'	12" × 5¾"	300 " 400	1½ " 2¾ H. P.	16' 6"	2,700 lbs.	580.00
With Wegmann's patent porcelain rolls.									
9" × 14"	5' 1½"	3' 10"	3'	12" × 5¼"	300 to 400	1½ to 2¼ H. P.	16' 6"	2,700 lbs.	$650.00
Divided four roller machines.									
9" × 14" single	5' 1½"	3' 10"	3'	12" × 5¼"	300 to 400	1½ to 2½ H. P.	16' 6"	2,700 lbs.	$580.00
1-pr. cor. 1-pr. sm.									
9" × 14" double	5' 1½"	3' 10"	3'	12" × 5¼"	300 to 400	1½ to 2½ R. P.	16' 6"	2,700 lbs.	615.00
1-pr. sm. 1-pr. cor.									
9" × 14"	5' 1½"	3' 10"	3'	12" × 5¼"	300 to 400	1½ to 2¼ H. P.	16' 6"	2,700 lbs.	625.00
1-pr. cor. 1-pr. cor.									

For grinding corn, feed, rye, etc,

Size.	Height.	Width.	Length.
6″ × 12″...	4′ 6″	3′ 5″	2′ 7″
9″ × 14″...	5′ 8″	3′ 10″	3′ 5′
9″ × 18″...	5′ 8″	4′ 9″	3′ 5′
9″ × 24″...	5′ 8′	5′ 6″	3′



The Nordyke Bradford Portable Mill.



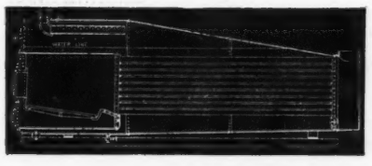
Size of stones, In.	Grinding capacity. Corn, bu. per hour.	Grinding capacity. Wheat bu. per hour.	Horse-power.	Weights. Sing'l gear.	Weights. Double gear.	Pulley mill.	Geared mills. Iron wh'ls.	Geared mills. Mortise wh'ls.
18	8 to 10	.....	4	550	625	$130	$165	$180
20	10 to 12	.....	5	600	700	140	175	190
22	12 to 15	.....	5	700	850	160	190	210
24	15 to 18	.....	6	900	1050	175	210	225
26	18 to 20	8 to 10	8	1200	1400	185	225	250
30	20 to 25	10 to 12	10	1500	1700	225	265	290
36	25 to 30	14 to 17	12	1800	2100	315	355	380
42	35 to 40	19 to 21	15	2000	2300	390	435	460

Driving pulley.	Revolutions per minute.	Length of belt above floor.	Approximate shipping weight	Price.
10″ × 5¼″	400 to 500	14′	.....	$500.00
14″ × 6¼″	350 to 450	18′	2800 lb.	600.00
14″ × 7¼″	350 to 450	18′	3050 lb.	650.00
14″ × 8¼″	350 to 450	18′	3350 lb.	735.00

Flue Boiler (Scotch).

F. W. IREDELL.

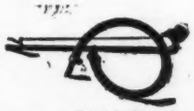
Self-contained. Portable. Economical. Durable.



Horse power	8	10	15	20	25	30	35
Diameter	28″	32″	32″	36″	40″	40″	44″
Length, feet	9½	10	12¼	13¼	14¾	16¼	16¾
Weight, pounds	3500	4000	4500	5,000	6500	6900	7500
Price, $	.....	.....	387	487	580	634	767
Horse power	40	45	50	55	60	70	80
Diameter, inches	44	48	48	52	52	56	56
Length, feet	17½	16½	18	17½	18½	18	19
Weight, pounds	8000	8500	8800	9500	10,000	11,000	12,000
Price, $	827	920	1027	1147	1227	1387	1500

Discount, 10%.

Flue Cleaner.
Hurley's Automatic Steam Flue Cleaner.



No.	Outside diam. of tubes.	With hose clamps.	Globe Valves.	Best 4-ply steam hose. Per foot.
1	1½ to 2	$5.00	½, 95 cents	¾, 67 cents.
2	2 to 2½	6.25	½, 95 cents	¾, 67 cents.
3	2½ to 3	7.50	¾, $1.30	¾, 67 cents.
4	3 to 3½	8.75	1, 1.75	1¼, 83 cents.
5	3½ to 4½	10.00	1¼ 2.90	1¼, $1.04

Dis. on flue cleaners, 60 and 10%.
Dis. on steam hose, 50%, good to 90 lbs steam.

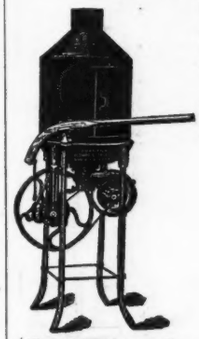
Forges (Portable).
Fairbanks.

No. 2c, weight,	155 lbs.	21 × 27	hearth	.....	$42.00
" 3a, "	80 "	18 in.	diam. hearth	.....	27.00
" 3b, "	75 "	18 "	" "	.....	24.00
" 3c, "	85 "	18 "	" "	.....	30.00
" 6a, "	45 "	14 "	" "	.....	18.00
" 6B, "	45 "	14 "	" "	.....	16.00

Dis. 60%.

No. 1, 18 in. bellows, $20; No. 2, 20 in. bellows, 25; No. 3, 22 in. bellows, $30.
20% dis.
Stationary.
27 in. bellows, $21; 30 in. bellows, $25; 33 in. bellows, $33; 36 in. bellows, $45.
20% dis.

Riveting Forges.
Bellows, 18 in., 20 in., 22 in., 24 in.,
$8.00. $10.00. $13.00. $17.00.
20 % dis.



Light work, 12 × 17; height, 15 in., $16.00.
Same, with Hood, 12 × 17; height, 28 in., $20.00.
Bridge, Boiler or Railroad work, Pan, 17 × 19; height, 29 in.; Fan, 8 in., $27.00.
Same, with Hood, $30.00.
Water Tank, $4.00 extra.
Iron Fire Ring Round Tuyere, $1.00 extra.
50 % dis.

Fruit Evaporator.
No. 1. Evaporator..... $30
No. 2. Fruit Drier and Baker, with Bleacher attachment. Weight, 225 lbs. Capacity, 5 to 7 bushels apples per day; 24 in. deep, 26 in. wide, 5½ ft. high; 12 trays, 22 22; 40 square feet drying surface. Complete..... $50
No. 3. Capacity, 15 to 20 bushels per day..... 100
No. 4. Capacity, 20 to 30 bushels per day..... 160
Dis., No. 1, 3 and 4 = 20%. No. 2 = 30%.
Boxing, extra:
No. 1, $3.00; No. 2, $5.00; No. 3, $7.50; No. 4, $12.50.
Freight to New York:
No. 1, $4.00; No. 2, $6.00; No. 3, $12.00; No. 4, $18.00.

Gaskets.
Corrugated Copper.
Price, 2 cents per square inch, less 30 per cent. discount for home trade.
Less 60% discount for export trade.

Glass Tube Cutters.

One Arm Carries Rotary Cutter Price, $2.50 each.

Glassware.

6-in. bowl and cover, per doz				$3.25
7-in.	"	"	"	4.50
8-in.	"	"	"	6.00
9-in.	"	"	"	8.00
10-in.	"	"	"	10.50

Net.

Nappy, 4½-inch., per doz., 50c.; 6-inch., per doz., $2 nch ., per doz., $3; 8-inch., per doz' $4.
Cream Pitcher, 1 pint, per doz., $1.25; one quart, per doz., $3.50; 3 pints, per doz., $4.50.
Pint Pitcher, per doz., $1.50; quart pitcher, per doz., $2; ½ gallon pitcher, per doz., $3; 3 quart pitcher per oz., $4.50.

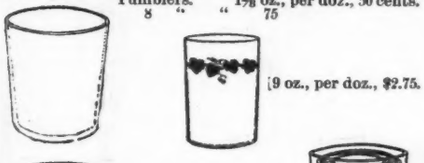
Flange Butter and Cover, per doz., $1.75.
Water Set, per doz., sets of 60 pieces, $7.50.

Cheese Dish and Cover, 8 in., per doz., $4.50.
Quart Water Bottle, per doz., $4.50.

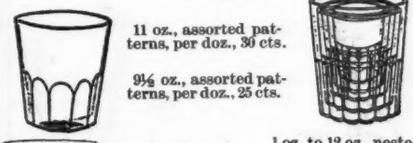
Ind. Salts; per gross, $2.00. Assorted patterns.
4 Bottle Castors, per doz., $7.50; 3 bottle, per doz., $4.50.

Berry Dish, 4½-inch , per doz., 50c.; 10-inch, per doz., $4.
Butter Dish and Cover, per doz., $1.25.
Butter Dish and Cover, per doz., 75c.

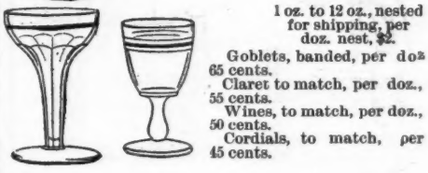
Candlesticks, per doz., $2.00. Glass Slipper for Flowers, per doz., 50 cents; slipper and tray, per doz., $1. Jam Jar and Cover, 1 qt., per doz., $2.50; ½ gal., per doz., $3.25; ¾ gal., per doz., $4; 1 gal., per doz., $5; 1½ gals., $9; 2 gals., per doz., $12. Pocket Flask, 1 pint, $1.
Tumblers. 1⅝ oz., per doz., 50 cents.
8 " " 75



9 oz., per doz., $2.75.



11 oz., assorted patterns, per doz., 30 cts.
9½ oz., assorted patterns, per doz., 25 cts.



1 oz. to 12 oz., nested for shipping, per doz. nest, $2.
Goblets, banded, per doz 65 cents.
Claret to match, per doz., 55 cents.
Wines, to match, per doz., 50 cents.
Cordials, to match, per 45 cents.

Goblets, per doz., 50 cts.
Claret, " 50 "
Wine " 35 "

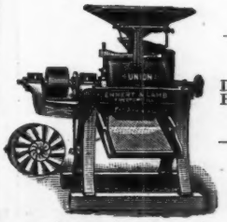
Banded, open, hollow stem.
Champagne, per doz., $1.25.

½ Pt. tumbler, per doz. .55 cts.
½ Pt. mug to match, " .65 "
Goblet, " " .50 "
Spoon holder, cream pitcher, sugar, butter dish to match.
Sets of 4 pieces, per doz. sets, 48 pieces, $3.75.

Grinding Mills.—Emmert & Lamb.

"Daisy," without Shaking Bolt, 170 pounds, 9 cubic feet, $40.
"Daisy," with Shaking Bolt, 185 pounds, 9 cubic feet, $48.
} Discount 25 per cent.

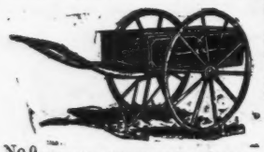
"The Union Mill."



Diameter of Buhr Stones	Size of Pulleys. Diam.	Face.
12 in.	8 in.	6¼ in.
16 "	9 "	7½ "

Horse Power	Capacity in B'sh's	Speed	Without Bolt	With Bolt	Sacking Elevator, Extra	Extra Metal Buhrs
8 to 10	12 to 30	1200 to 1500	$90.00	$105.00	$15.00	$1.20 pair
10 to 15	20 to 50	1000 to 1200	160.00	178.00	17.50	1.50 "

Hand Carts No. 0 42 wheel, 1 in. tread, 1 in. axle box 48x28x10 deep, $10.50.



No. 1, 36 wheel, 1 in. tread, ⅞ in. axle, box 40x23x10 deep, $9.00.

No. 2, 30 wheel, ¾ in tread, ¾ in. axle, box 32x20x9 deep, $8.25.

With Wagon-Seat Spring.

No. 6, same sizes as No 0.....$12.00
" 7, same sizes as No. 1..... 10.50
" 8, " " " No. 2..... 9.75

With Third Wheel, Without Springs.

No. 3, same sizes as No. 0.....$12.00
" 4, " " No. 1..... 10.50
" 5, " " " No. 2..... 9.5

Hardware Specialties.

AUGERS.

Patent Adjustable Hollow.

Cuts from ¼ to 1¼, pivoted jaws, graduated scale to 1-16ths, per doz., $60.00.

Discount, 15 and 10%.

Patent Hollow Auger.

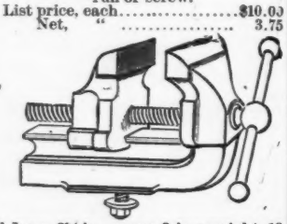
Inch.....	5-16	⅜	7-16	½
With bits....	12.00	12.00	12.00	12.00
Without bits	8.00	8.00	8.00	8.00
9-16	⅝	¾	⅞	1	1⅛
14.00	14.00	14.00	16.00	16.00	20.00
9.00	9.00	9.00	13.00	13.00	14.00
1¼	1⅜	1½			
20.00	24.00	24.00			
14.00	16.00	15.00			

Discount, 15 and 10%.

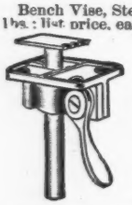
BENCH DRILL.

Adjustable bed plate. 26½ high drills to ½ in. hole, 3½ run of screw.

List price, each.....$10.00
Net, " 3.75

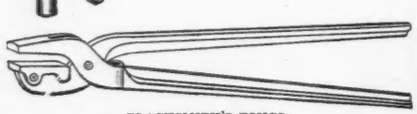


Bench Vise, Steel Jaws, 3½ in., opens 3 in.; weight, 12 lbs.; list price, each, $4.00.; net price, each, $1.60.



BENCH HOOK.

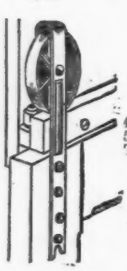
Patent, adjustable and reversible
List $9 dozen, ½ dozen in box.
Discount, 20 and 10%.



BLACKSMITH'S TONGS.

Swivel Jaw.

No. 1, 16 in., per doz.....$10.00
" 2, 18 " " 10.00
Dis. 20%.



BARN DOOR HANGER.

4 in., per doz. pairs.....$12.00
5 " " " 14.40
Track, per foot..... .08
One dozen pairs in case.
Dis., 50%.

CASTERS.

Swivel Store Truck

No. 20, japanned, 4 in. wheel, each..... .55
No. 25, " 5 " " " ..... .75

Noiseless turned wheel.

No. 30, japanned, 4 in. wheel, each..... 1.30
No. 35, " 5 " " " 1.60

Discount, 25%.

Store Truck, stationary.

No. 50, 5-inch wheel, 1½ inch wide each, $1.05.
No. 60, 5-inch, extra heavy, 1½ inch wide, each $1.50.
Discount, 25%.

CLOTHES REEL.

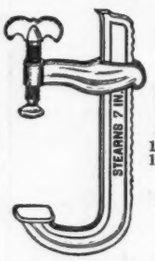
Extra heavy, gray iron, japanned.
List per doz.....$15.00
Net " 7.00

JACK SCREWS.

New pattern wrought iron screw.

No.	Rise of screw.	High.	Diameter screw.	Price.
20	4½ in.	10 in.	2 in.	$4.50
25	6½ "	12 "	2 "	5.25
30	8½ "	14 "	2 "	5.75
	11½ "	16 "	2 "	6.50

Discount, 40%.



SCREW CLAMPS.

Adjustable.

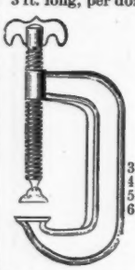
3 in., per doz.....$4.00
5 " " 6.50
7 " " 9.00
9 " " 10.50
12 " " 15.00
16 " " 20.00

½ doz. in box.
Discount, 20 and 10%.

CLAMPS.

New Door Frame.

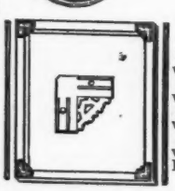
3 ft. long, per doz., $8 list; $5 per doz. net.



Malleable Iron Screw Clamps.

Per Doz.		Per Doz.	
3 in.....	$7.00	7 in.....	$20.00
4 "	10.00	8 "	25.00
5 "	12.00	9 "	27.50
6 "	16.00	10 "	30.00

3, 4, 5, 6 in., ½ doz. in box.
Dis., 70%.



WINDOW SCREEN FRAMES.

Patent Japanned Corners.

No. 25, 36 by 36 corners and screws, without bead, per doz., $2.50.
No. 25, 36 by 36 corners and screws, with bead, per doz., $2.90.
No. 35, 42 by 42 corners and screws, without bead, per doz., $2.90.
No. 35, 42 by 42 corners and screws, with bead, per doz., $3.30.
Black satin stain, sticks ⅞ by 1 in.
Dis., 20 %.

PULLEYS.

Side, No. 45, Japanned.

Inches...	1	1½	2	2½	3	4	5
Per doz..	.90	1.00	1.60	2.40	3.50	9.00	15.00

2 inch and under, 2 dozen in box: 2½, 3 and 4, 1 dozen in box; 5 inch, ½ dozen in box.

Discount, 50%.

PULLEY HOOK (New Floor.)

Deep cut thread, forged point.

Per doz.
¾ in. wrought iron, 8 in. long, list..... $1.20
net..... 1.00

WELL WHEEL.

New pattern.
Japanned.

In.	8	10	12	14	16
Pr.d.	7.00	9.50	12.50	20.00	30.00

Discount, 70%.

HAY FORK PULLEY.

New pattern.

No. 15, 5 in. iron wheel.....per doz. $4.50
25, 5 in. wood " ..... " 4.50
06, 6 in. " " ..... " 6.00

4 dozen in case, 8 dozen in barrel.

No. 15, per dozen, $2 net.

SHEAVES.

Patent Common

Turned and polished iron wheels, round corners, brass pin, one set in box.

2½ inch.....$1.50
3 " 1.60
4 " 2.00
5 " 2.60

Discount, 50%.

SINKS.

All 6 inch deep.

14 × 20 in....	$1.50	18 × 30 in....	$2.50
15 × 25 in....	1.75	18 × 32 in....	3.00
15 × 27 in....	2.00	18 × 36 in....	3.00
16 × 24 in....	1.80	20 × 30 in....	3.00
16 × 28 in....	2.10	20 × 36 in....	3.70
17 × 30 in....	2.25	20 × 40 in....	4.00
18 × 24 in....	2.10		

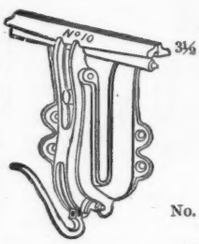
Discount, 60%.

SPOKE POINTERS.

Per doz.
No. 1, points 1⅞ in. diameter, $9.00
No. 2, points 2⅝ in. diameter, $15.00

Discount, 15 and 10%.

½ dozen in box.



VISE.

(Bench Vise, Steel Jaws.)

3½ in. opens 5 in., weight 12 lbs.
List price, each..$4.00
Net " " .. 1.60

Silent Saw Vise.

No. 10., 10 in. jaw, per doz....$15.00
Dis., 33⅓%.

No.	per dz.	gr., lbs.	No.	per dz.	gr., lbs
1	Amateur vise.....$2.25	70	Clamp. 1½.....	3.00	80
Anvil.			2½.....	5.00	220
			3½.....	14.25	700
2	..... 3.75	200	4½.....	21.00	1,425
3	.....11.25	615	Combination		
4	.....18.00	1,350	hand.....	5.25	85
10	.....24.00	1,675			

Spot cash discount, 33, 20 and 2, f.o.b.

Nos. 1, 1½, 2 and 2½ are packed in dozens; Nos. 3 and 3½ in half dozens; Nos. 4, 4½ and 10 in quarter dozens, and No. 20 singly. Each hand vise is put up in neat box and packed in half dozen lots.

1 Hinge pipe vise, 0 to 2 in. pipe.....Each $10.00
2 " " 0 to 4 in. pipe..... 20.00
1 Malleable pipe vise, 0 to 2 in. pipe..... 8.00
1 Combination pipe and bench vise, 0 to 2 in. pipe...16.00
Discount, 50%.

WRENCHES.

Coes' Knife Handle Wrenches.

BLACK.

Size.	℔ doz.	Size,	℔ doz.
6 inch.....	$9.00	15 inch.....	$24.00
8 "	10.00	18 "	30.00
10 "	12.00	21 "	36.00
12 "	14.00		

BRIGHT.

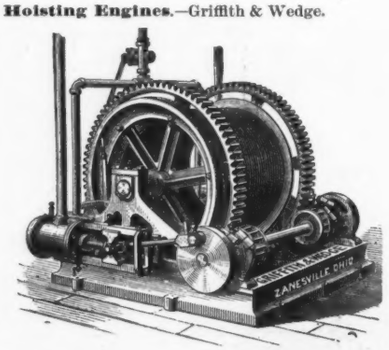
4 inch.....	$10.00	12 inch.....	$16.00
6 "	10.00	15 "	26.00
8 "	11.00	18 "	32.00
10 "	14.00	21 "	38.00

Discount, 55, 10, 7½ and 3 %.

Coes Mechanics' Screw Wrenches, same list, less 55 10, 10, 7½ and 3 %.

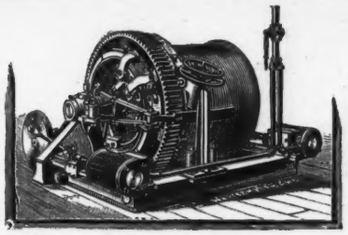
A. G. Coes & Co. Pat. Screw Wrenches, same list as above. Discount, 55, 10, 7½ and 3%.

Hoisting Engines.—Griffith & Wedge.



	Weight.	$
Hoisting Engines, Miner's Prospecting.....	4,500	750
Hoisting Engines, No. 1 Double Cylinder...	4,500	800
Discount, 20%.		
" " No. 2 Double Cylinder...	6,000	1,000
" " No. 3 " " ...	11,000	1,550
" " No. 4 " " ...	15,500	1,800
" " No. 5 " " ...	17,000	2,100
" " No. 6 " " ...	13,600	1,750
" " No. 7 " " ...	17,000	2,100
" " No. 8 " " ...	19,000	2,400
" " No. 9 " " ...	48,000	4,500

Discount, 25%.



Webster Camp & Lane Machine Co.

Single drum. No.	Average Load. Pounds.	Double drum. Approx. weight, complete. Pounds.
$825.00 = 5	1,950	6,000 = ...
918.50 = 6	1,650	6,500 = ...
1,177.00 = 7	2,200	8,000 = $1,661.00
1,331.00 = 8	3,000	8,500 = 1,815.00
1,694.00 = 9	3,500	14,000 = 2,722.50
1,914.00 = 16½	3,700	16,000 = 3,124 00
2,343.00 = 17½	5,500	19,000 = 3,333.00
2,475.00 = 18	5 500	22.000 = 3,872.00

Ice Machines (Family). L. DERMINGNY & Co.

No. 1, Ice machine, ice and ice cream molds, 1 lb. ice, $15.00.

No. 2, Ice machine, ice and ice cream molds, 1½ lbs. ice, $20.00.

No. 3, Ice machine, ice and ice cream molds, 1 carafe 1 bottle holder, 2 lbs. ice, $26.50.

No. 4, Ice machine, ice and ice cream molds, 2 carafe 1 bottle holder, 4 lbs. ice, $33.00.

No. 5, Ice machine, ice and ice cream molds, 3 carafe 1 bottle holder, 6 lbs. ice, $40.00.

No. 6, Ice machine, ice and ice cream molds, 4 carafe 1 bottle holder, 9 lbs. ice, $46.50.

India Rubber Goods. MECHANICAL.

RUBBER BELTING.

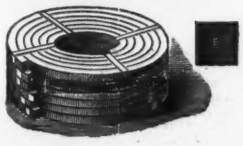
Inches.	2 ply per foot.	3 ply per foot.	4 ply per foot.	5 ply per foot.	6 ply per foot.
1	$0.07	.....	.....	.....	.....
1¼	0.09	.....	.....	.....	.....
1½	0.11	.....	.....	.....	.....
2	0.15	$0.17	$0.21	.....	.....
2½	0.18	0.22	0.26	.....	.....
3	0.22	0.26	0.31	.....	.....
3½	0.26	0.30	0.37	.....	.....
4	0.30	0.34	0.42	.....	.....
4½	0.33	0.39	0.47	.....	.....
5	0.36	0.43	0.52	.....	.....
6	0.43	0.52	0.62	.....	.....
7	0.51	0.60	0.73	.....	.....
8	0.59	0.70	0.84	$1.05	$1.25
9	0.67	0.80	0.95	1.18	1.42
10	0.75	0.90	1.07	1.33	1.60
11	0.83	1.00	1.18	1.47	1.77
12	0.91	1.08	1.30	1.62	1.95
13	1.00	1.18	1.42	1.77	2.13
14	1.08	1.28	1.54	1.92	2.31
15	1.16	1.38	1.66	2.07	2.49
16	1.25	1.50	1.78	2.22	2.67
18	1.41	1.70	2.02	2.52	3.03
20	1.58	1.90	2.26	2.82	3.39
22	1.76	2.12	2.52	3.15	3.74
24	1.96	2.36	2.80	3.50	4.20
26	2.18	2.60	3.08	3.85	4.62
28	2.42	2.84	3.36	4.20	5.04
30	.....	.....	3.64	4.55	5.46
32	.....	.....	3.92	4.90	5.88
34	.....	.....	4.20	5.25	6.30
36	.....	.....	4.48	5.60	6.72
38	.....	.....	4.76	5.95	7.14
40	.....	.....	5.04	6.30	7.56
42	.....	.....	5.32	6.65	7.98
44	.....	.....	5.60	7.00	8.40
46	.....	.....	5.88	7.35	8.82
48	.....	.....	6.16	7.70	9.24
50	.....	.....	6.44	8.05	9.66
52	.....	.....	6.72	8.40	10.08

Dis. Reliance, 60 and 5. Dis. Royal, 60, 10 and 10. Dis Manhattan, 70 and 5. See Leather Belting, page 3; Link Belting, page 9.

PACKING.

Piston Packing.

Round Piston Packing Per lb. 85c. Discount, 60, 10 and 5 per cent.

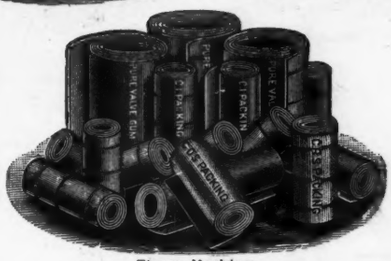


Square Piston Packing.

Price same as above. Round and square piston packing is made in lengths of twelve or twenty-four feet.

Square Piston Packing. Rubber back, per pound $1. Discount 60 per cent. Best only.

Square piston packing rubber back is made in lengths of twenty feet.



Steam Packing.

Cloth Insertion, Rubber Outside.

Cloth Insertion, Cloth on one or both sides.

Thickness.	1-Ply.	2-Ply.	3-Ply.	4-Ply.
1-64 inch	70 cts.	.....	.....	.....
1-32 "	65 cts.	.....	.....	.....
1-16 "	60 cts.	63 cts.	66 cts.	.....
3-32 "	55 cts.	58 cts.	61 cts.	.....
1-8 "	55 cts.	55 cts.	58 cts.	61 cts.
3-16 "	55 cts.	55 cts.	55 cts.	58 cts.
1-4 "	55 cts.	55 cts.	55 cts.	55 cts.

One-ply of cloth to every 1-16 inch thickness.

Three cents per pound additional will be charged for each extra ply of cloth. Each cloth, whether insertion or on outside, to count as one ply.

All cloth insertion or plain packing is one yard wide and any length desired.

Wire insertion packing, all thicknesses, per lb, 50 cents.

Discounts: Reliance, 70 & 10; Royal, 60, 10 & 10; Manhattan, 60 per cent.

See Packing, page 10.

HOSE.

Improved "Smooth Bore" Rubber Suction Hose.

On spiral flat or round tinned steel wire.

Int. Diam.	Per ft.
2 inch	$2.60
2½ "	3.50
3 "	4.00
3½ "	5.50

In. Diam.	Per ft.	Per. Diam.	Per ft.
inch	6.50	7 inch	$13.50
4½ "	7.50	7½ "	15.00
5 "	8.50	8 "	16.50
5½ "	9.50	9 "	19.50
6 "	10.50	10 "	22.50
6½ "	12.00	12 "	27.50

Suction hose discount: Reliance, 50 and 10%; Royal, 60, 10 and 5%; Manhattan, 70 and 5%.

SUCTION HOSE.

On spiral brass or iron wire

Int. Diam.	Per. ft.
¾-inch	$ .77
1 "	1.00
1¼ "	1.25
1½ "	1.65
1¾ "	2.10
2 "	2,50

RUBBER HOSE.

Conducting Hose—Two-ply.

Int. diam.	Per ft.	Int. diam.	Per ft.	Int. diam.	Per ft.
⅛ in.	$0.20	2 in.	$0.66	5 in.	$1.65
¾ in.	25	2¼ in.	75	6 in.	1.98
1 in.	33	2½ in.	83	7 in.	2.31
1¼ in.	42	2¾ in.	92	8 in.	2.64
1½ in.	50	3 in.	99	9 in.	2.97
1¾ in.	58	4 in.	1.32	10 in.	3.33

HYDRANT HOSE—THREE-PLY.

⅛ in.	$0.25	1½ in.	$0.60	2½ in.	$1.00
¾ in.	30	1¾ in.	70	2¾ in.	1.10
1 in.	40	2 in.	80	3 in.	1.20
1¼ in.	60	2¼ in.	90	3½ in.	1.40
				4 in.	1.60

Discount—Reliance, 60; Royal, 70; Manhattan, 70 and 10 per cent.

Indurated Fibre Ware.

SPITTOONS.

	Doz.
16 in. dia., 8 in. high	$24.00
12¼ in. dia., 5½ in. high	10.80
9 in. dia., 5 in. high	7.80

WASH TUBS.

No. 0, 23 in.	⅛	12	27.00
Nos. 0, 1, 2 and 3, nested	1	n. 3½	22.50
No. 1, 21 in.	⅛	10½	24.00
No. 2, 19½ in.	⅛	9	21.00
No. 3, 18½ in.	⅛	9	18.00
Nos. 1, 2, and 3, nested	⅛	9¾	21.00

Dis. on all 25 and 20%.

Pails.	No. doz. in crate.	Cubic feet.	Price per doz.
Ladies' or Weaver's pails, 6 qt.	1	2¾	$5.35
Half or buggy pails, 6 qt.	1	3	4.80
Star pails (standard plain), 12 qt., stenciled "for fire only" without extra charge.	1	3½	6.00
Deck or Mason's pails (same size as Star, but heavier, with heavy wire bail).	1	4	6.60
Railroad or fire pails, 14 qt. (also stenciled "fire" without extra charge).	½	3½	7.80
Fire pails, round bottoms.	1	4	7.80
Milk pails, 14 qt.	1	4	7.80
Stable pails, flush bottom, heavy wire bail, 14 qt.	1	4	7.80
Stable pails, 16 qt., same as above.	½	3½	8.40
" 18 " " "	½	3¾	10.70
" 20 " " "	½	4	12.00
Covers for fire or star pails.		1	3.35

KEELERS.

		Doz.
A—20 in.	7 in. deep.	16.20
B—19 "	" "	15.00
C—18½ "	" "	14.00
1—17½ "	" "	13.20
2—15½ "	6 in. "	12.00
3—13¾ "	5 in. "	10.20
4—12 "	4 in. "	9.00

MILK OR VEGETABLE PANS.

13½ in. dia 3¼ in. deep, 6 quarts, $3.60 per doz.

WASH BASINS.

	Doz.
12½ in.	$4.80
12½ in.	4.20
11½ in.	3.60

CHAMBER PAILS.

12 in. dia., 9 in. deep, 3 gal. 16.00

WATER COOLERS.

	Doz.
3 gal.	$32.00
4 "	40.00
5 "	44.00
6 "	48.00
8 "	64.00
10 "	80.00
12 "	96.00
15 "	120.00

WATER COOLERS AND FILTERS.

	Doz.
4 gal.	$96.00
5 "	108.00
6 "	120.00
8 "	144.00
10 "	192.00
15 "	288.00

Lamps.

Drummond Electric Hanging Lamp, 300 candle power, complete, each $3.50.

The electric lamp, 60 candle-power.

With decorated shades, nickel, per doz. $22.00

With opal plain shades, nickel, per doz. 18.00.

With decorated shades, brass, per doz. 21.00.

With opal plain shades, brass, per doz. 17.00.

Lamp chimney patent for Sun burners.

Per doz. No. 0, 50 cents. No. 1, 60c. No. 2, 75c.

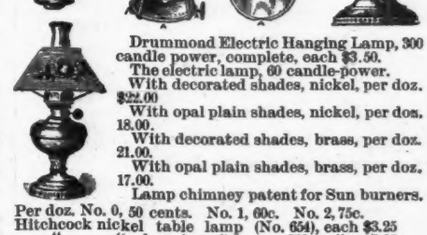
Hitchcock nickel table lamp (No. 654), each $3.25

" " hanging " 656 " 7.25

" " bracket " 651 " 3.50

" " " with reflector 653 " 3.75

" French bronze bracket, with reflector, No. 653, each $3.75.



Miners'.

Brass, Collar and Breast in one piece, Spout and Body in one piece.

Price, $9 per gross net.

Harp, complete, with square tin shade, per doz., $9.50.
Complete, with Burner and chimney, per doz., $1.50.
Hurricane lanterns 25 cents extra with guards.
875, ⅝ wick, without guards, per doz., $5.00.
876, square safety lifting globe, per doz., $5.50.
877, ⅝ wick, safety lifting globe, per doz., $6.75.
Nickel plated diamond reflector reading lamp, 30 candle-power, $13.50 per doz.
Net.
Illuminated night clock, per doz., $27.

PAPER LAMPS.
Lined with oil proof composition.

	No. 0.	No. 1.	No. 2.
Height,	2¼ in.	3 in.	3¾ in.
Diameter,	3¼ in.	2½ in.	2¾ in.
Weight, ₱ doz.,	3¼ lbs.	1¾ lbs.	2 lbs.
Price, $2.75 per doz.		$2.25	$2.75

	No. 0.	No. 3.	No. 4.
Height,	2½ in.	5 in.	6½ in.
Diameter,	3¼ in.	3½ in.	4 in.
Weight, ₱ doz.,	3¾ lbs.	3½ lbs.	7 lbs.
Price, $2.75 per doz.		$3.25	$4.50

Dis., 30%.

Laundry Appliances.—Empire Wringer Co.

Rolls.
"Volunteer." Length, 10 in.x1¾ in. dia. $40 doz.
"Volunteer." Length 11 in.x1¾ in. dia. $50 per doz.
"Volunteer." Length 12 in.x1¾ in. dia. $60 per doz. Dis., 40%.

"Volunteer." Two independent pressure screws,
"Daisy." Length, 10 in.x1¾ in. dia. $30 per doz.
"Daisy." Length, 12 in.x1¾ in. dia. $48 per doz. Dis., 40%.

"Empire." Length, 10 in.x1¾ in. dia. $63 per doz.
"Empire." Length, 11 in.x1¾ in dia. $74 per doz.
"Empire." Length, 12 in.x1⅞ in. dia. $84 per doz.
"Empire." Length, 12 in.x1⅞ in. dia. $87 per doz.
"Empire." Length, 14 in.x2¼ in. dia. $156 per doz.
"Empire." Length, 14 in.x2¼ with pulleys. $220 per doz.
"Empire." Length, 16 in.x2½ with pulleys. $360 per doz.
Dis., 40%.

EMPIRE CLOTHES DRYING BARS. $10 per doz. Dis., 40%.

Closed.

Open for use.

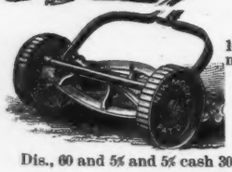
Lawn Mowers. Forward Cut Mowers.

In.	Lbs.		In.	Lbs.	
10	Weight, 30¾	$13.00	16	Weight, 38	$19.00
12	" 31½	15.00	18	" 41	21.00
14	" 36	17.00	21		34.00

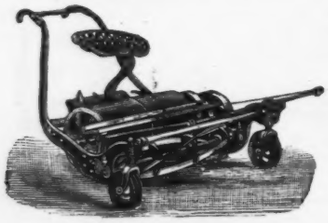
Dis. 60 and 5%.

10 in.	12 in.	14 in.
$13.00	$15.00	$17.00
16 in.	18 in.	20 in.
$19.00	$21.00	$23.00

24 in., $30.00.
Geared at both ends. Dis. 60 and 5 and 5%.



Chadborn & Caldwell Mfg. Co.
10 in. Croquet, 18 pound, mower..... $11.00
10 in..... 13.00
12 in..... 15.00
14 in..... 17.00
16 in..... 19.00
18 in..... 21.00
20 in..... 23.00
Dis., 60 and 5% and 5% cash 30 days, f.o.b. New York.



New Excelsior Horse Lawn Mower.
25 in. cut, without shafts or seat..... $65.00
30 " with shaft and seat..... 110.00
35 " " " " " 135.00
40 " " " " " 170.00
Horse boots, per set..... 12.00
Dis. 50%.

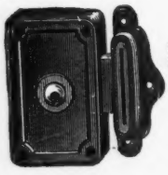
Excelsior Three-Blade Mower and Roller.
8 in., $11.00; 10 in., $13.00; 12 in., $15.00; 14 in., $17.00; 16 in., $19.00; 18 in., $21.00; 20 in., $23.00.
Dis. 60% and 5% cash 30 days f.o.b. New York.

Link Belting.
Link-Belt Machinery Co.'s. Price per running foot net.

No.	Price.	No	Price
25	$0.13	78	$0.40
32	.13	83	.45
33	.12	85	.50
34	.13	88	.50
35	.14	95	.60
42	.16	103	.75
45	.16	105	.70
51	.20	106	.90
52	.25	107	.80
55	.22	108	.80
57	.24	109	.90
62	.30	114	1.10
66	.30	122	1.50
67	.30	124	1.30
75	.35	146	1.40
77	.35		

Sprocket wheels..... 25%

Locks.

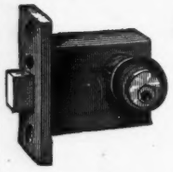


YALE PATENT.
RIM STORE LATCH.

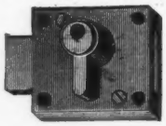
	Per doz.
3 × 5 in., 4 keys	$48.00
2½ × 4 in., 3 keys	39.00

RIM NIGHT LATCH.
Spring lock, 3 keys..... 18.00
Dead lock, 3 keys..... 25.00

NIGHT LATCH.
Escutcheon..... 39.00
" 36.00

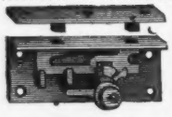


MORTISE DEAD LOCK.
4⅝ × 3½..... 45.00
2⅝ × 3½..... 24.00



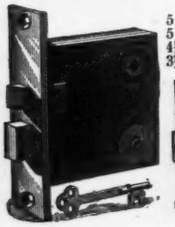
CUPBOARD LOCKS.
Plated Nose..... 13.20
Brass Nose..... 12.00

CUPBOARD
Dead Lock..... 10.80
Spring Lock..... 13.80



CHEST LOCKS.
Plated nose..... 19.20
Brass " 18.00

DRAWER LOCK.
Plated nose..... 10.20
Brass " 9.00

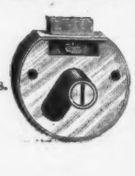


KNOB LOCKS.
5 × 3½..... 22.50
5 × 3⅛..... 20.00
4¼ × 3⅛..... 13.25
3½ × 3⅛..... 10.50

STANDARD LATCHES.
Dead locks.
3¾ × 2¾..... 24.00
2½ × 3⅝..... 14.00
1¾ × 2⅝..... 12.00

NIGHT LATCHES.
3¼ × 3¾..... 20.00
2½ × 3¾..... 18.00

DRAWER LOCKS.
2 × 1⅝, two tumblers.
Plated nose..... 7.50
Brass " 6.00
Three tumblers.
Plated nose..... 9.00
Brass " 7.50



RIM FLUSH DRAWER LOCK.
2 in. diameter.

	2 tumblers.	3 tumblers.
Plated nose	7.50	9.00
Brass "	6.00	7.50

BRONZE SPRING PADLOCK.
2 flat steel keys.

In.	
1	11.00
1¼	12.00
1½	13.50
1¾	14.50
2	16.00
2¼	17.50

Subject to special net prices; no discount.

YALE KEYS.

Machinery—Foot Power.

S., M. & Co.'s Screw-Cutting Engine Lathes.
8 in. swing, 20 in. bet. centers, 36 in. bed, 240 lbs. weight, $60.
8 in. swing, 30 in. bet. centers, 46 in. bed, 260 lbs. weight, $70.
8 in. swing, 36 in. bet. centers, 52 in. bed, 280 lbs. weight, $75.
Boxing for export, $2.50 extra; f.o.b. at Cincinnati, 25 & dis.

SAWS AND LATHES.

Victor Scroll Saw, Cuts to 3 Inches.
24-inch swing, with 12 saw blades.... $40
Dis., 20%.

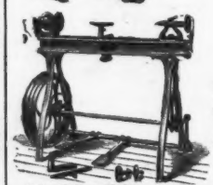
Empire Scroll Saw, Cuts to 3 Inches.
24-in. swing, drill and tilting table.
Price, boxed..... $25
Dis., 20%

The Acme Combination Saw.
Hand or steam power.
Adjustable table and gauges.
Price, boxed..... $40
Scroll saw attachment..... 7
Boring attachment..... 10
Moulding attachment..... 10
Dis., 20%.

Paragon Self Feed Rip Saw.
Two changes of speed; three changes of feed.
Price, with one 10 in. saw, $50.00
Dis., 20%.

Diamond Mortising Machine.
With mortise ¼ to 1 in. wide, 3 in. deep.
" cut tenons ⅛ to ¾ thick, 3 in. wide.
Price, with 3 chisels..... $25.00
Dis., 20%

The "Star" Lathe.
Swings 9 × 25 in., back geared screw cutting.
Feeds in or out, right or left. Adjustable Tail Stock for Tapers.
Price..... $75.00
Dis., 15%.



The Crown Lathe.
Swings 10 × 36 in.
Price, boxed..... $45.00
Compound slide rest... 15.00
Countershaft 10.00
Dis., 20%.

Rival Scroll Saw, with six extra saw blades, twist drill and wrench.
Price..... $10.00
Lathe attachment..... $3.00
Dis., 25%.

The Challenge Scroll Saw, for shell, bone wood, or metal.
Nickel Plated, with six extra saws, twist drill and wrench.
Boxed..... $20.00
With lathe attachment..... $5.00
Dis., 25%.

Hand Circular Rip Saw.

Cuts 3¾ thick, 19 in. wide.

Price $50.00.

Dis.,

W. F. & J. Barnes Co.

Scroll and Circular saw Combined. Combined Machines.

Combined circular scroll saw and boring attachment—2 circular saws, 12 assorted scroll saws, boring attachment, and self-centering drill chuck.....$50.00

Combined circular and scroll saw—2 circular and 12 scroll saws..... 40.00

Circular saw—1 extra rip and 1 cross-cut saw..... 35.00

Scroll saw—12 assorted scroll saws..... 32.00

Counter shaft for steam power..... 10.00

Dis., 35%.

Foot Power Former. $20.00; Knives extra, $1.00 each. Dis., 35%.

Mortising Machine. $22.00; Chisels, $1.00 each.

Dis., 35%.

Blind Slat Chisels, 3 set bits, $5.00.

Dis., 20%.

Tenoning Machine. Price, $25. Dis., 35%.

Velocipede Scroll Saw.

Without boring attachment..... .....$20.00

With " " 23.00

1 doz. saw blades, 1 3-16 bit. } Included. Dis., 35%.

Lathe.

3 centres, 1 spur, 2 tool rests and sockets, 1 turned face-plate, $35.

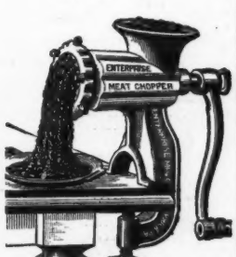
Dis., 30%.

Lathe.

One turned face-plate, two pointed and one spur center, two rests, with sockets and plate for hand tools, slide rest wrench, belting, etc., $40.

Dis., 25%.

Meat Cutters.



American.	1	2	3	4
each,	$5.00	7.00	10.00	25.00

Dis.—,

Enterprise.	10	12	22	32	42
each,	$3.00	2.50	4.00	6.00	15.00

Dis., 30%.

Motors (Water).

Size No. 8, for Sewing Machines, etc, $18 each.

No. 9, ⅛ horse-power (30 lbs. pressure), ¼ h. p. (50 lbs.), ½ h. p. (100 lbs.), ¾ h. p. (150 lbs.), 1 h. p. (200 lbs.), $30.

No. 10, ¼ horse-power (30 lbs. pressure), ½ h. p. (50 lbs.), 1 h. p. (100 lbs.), 1½ h. p. (150 lbs.), 2 h. p. (200 lbs.), $50.

No. 10½, ½ horse-power (30 lbs. pressure), 1 h. p. (50 lbs), 2 h. p. (100 lbs.), 3 h. p. (150 lbs.), 4 h. p. (200 lbs.), $75.

No. 11, 1 horse-power (30 lbs. pressure), 1½ h. p. (50 lbs.), 3 h. p. (100 lbs.), 4½ h. p. (150 lbs.), 6 h. p. (200 lbs.), $100.

No. 12, 2 horse-power (30 lbs. pressure), 3 h. p. (50 lbs.), 6 h. p. (100 lbs.), 9 h. p. (150 lbs.), 12 h. p. (200 lbs.), $175.

No. 13, 3 horse-power (30 lbs. pressure), 5 h. p. (50 lbs.), 10 h. p. (100 lbs.), 15 h. p. (150 lbs.), 20 h. p. (200 lbs.), $285.

Dis., 40%.

Governors for 11 and 12, $25 extra; for No. 13, $35 extra.

Mining Machinery.

N. B.—Special attention is invited to the goods advertised and illustrated in the advertising pages of the ENGINEERING AND MINING JOURNAL, quotations and discounts upon which would only mislead buyers.

Price-lists and other information may be obtained by addressing the advertisers direct, or by writing to the ENGINEERING AND MINING JOURNAL.

Concentrating Machinery. Fort Scott Foundry & Machine Works Co.

Blake Improved Crusher: 10x7, weight 7,500; $410.00.

Blake Improved Crusher: 15x9, weight 9,000; $580.00. Discount 25%.

Cornish Crushing Rollers: 20 diameter, 10 face, weight 5,400; $450.00.

Cornish Crushing Rollers: 20 diameter, 14 face, weight 6,000; $500.00.

Cornish Crushing Rollers: 22 diameter, 14 face, weight 9,500; $625.00.

Cornish Crushing Rollers: 27 diameter, 14 face, weight 13,000; $750.00.

Cornish Crushing Rollers: 30 diameter, 14 face, weight 15,000; $850.00.

Discount 25%.

Complete Sizing Arrangement, consisting of Revolving Screens of Steel Sheet and Hydraulic Classifier.

For Concentrator, 25 tons capacity, $250; 50 tons capacity, $350; 75 tons capacity, $450; 100 tons capacity, $800. Discount, 10 per cent.

Automatic working Jig Machines, all complete, woodword included, with slidemotion: 2 sieves, $300; 3 sieves, $360; 4 sieves, $450.

With Eccentric Motion, all complete, woodwork included: 1 sieves, $200; 2 sieves, $270; 3 sieves, $320; 4 sieves, $330.

Automatic working Double Jig Machines, all complete, woodwork included: 4 sieves, $210; 6 sieves, $335; 8 sieves, $425. Discount, 25 per cent.

Single Rittinger Percussion Tables, all the iron parts, $350; Double Rittinger Percussion Tables, all the iron parts, $500. Discount, 10 per cent.

Improved Rotary Tables, all the iron parts and pipes, $200. Discount, 25 per cent.

Nails and Tacks.

Swedes. Tacks.

Per doz.	½	¾	1	1½	2	2½	3	
½ wt..	35	40	46	50	55	60	65	75
	6	8	10	12	14	16	18	20	24 oz.
	85	1.00	1.20	1.40	1.60	1.75	1.85	2.15	2.55
Doz. full weight	½	¾	1	1½	2	2½	3	4
	60	70	80	90	1.00	1.10	1.20	1.40
	6	8	10	12	14	16	18	20	24 oz.
	1.60	1.90	2.30	2.70	3.10	3.40	3.80	4.20	5.00
lb., bulk or paper	½	¾	1	1½	2	2½	3	4
	1.60	1.25	1.00	80	66	58	52	46
	6	8	10	12	14	16	18	20	24
	36	32	31	30	29	28	28	28	28

Discount, 67½, 10 and 2%.

O. H. Swedes.

Price, same as Swedes.

Swedes steel tacks same list price as iron.

Upholsterers.

Discounts, 72½, 10 and 2%.

Price, same as Swedes.

Cut Tacks. Price per dozen ounces.

	1	1½	2	2½	3	4	6	8	10
¼ wt.....	...	...	...	...	35	40	45	50	55
	12	14	16	18	20				
	60	70	80	90	1.00				
½ wt.	1	1½	2	2½	3	4	6	8	10
	45	50	50	55	60	65	70	80	95
	12	14	16	18	20				
	1.10	1.25	1.40	1.55	1.70				
Full wt ..	1	1½	2	2½	3	4	6	8	
	80	90	90	1.00	1.10	1.20	1.30	1.50	
	10	12	14	16	18	20			
	1.80	2.10	2.40	2.70	3.00	3.30			

Discount, 70, 10 and 2%.

Carpet Tacks, flat and oval heads.

Blued, doz. oz.	4	6	8	10	12	14	16	18	20
¼ wt.	35	40	45	50	55	65	75	85	95
	22	24							
	1.05	1.15							
" ½ wt.	4	6	8	10	12	14	16		
	65	70	80	95	1.10	1.25	1.40		
	18	20	22	24					
	1.55	1.70	1.85	2.00					
Tinned, doz. ¼ wt.	4	6	8	10	12	14	16		
	50	55	60	75	85	1.00	1.10		
	18	20	22	24					
	1.20	1.35	1.45	1.60					
Tinned, doz. ½ wt.	4	6	8	10	12	14			
	95	1.05	1.15	1.40	1.60	1.85			
	16	18	20	22	24				
	2.10	2.35	2.60	2.85	3.10				

Discount, 72½, 10 and 2%.

Finishing Nails.

Inch...	⅝	3½-8	4-8	4½-8	⅝	5½-8	6-8	7-8	1
Per lb...	48	40	32	28	26	24	22	20	18

1⅛ and larger.

16

Discount, 60, 10 and 2%.

Chair Nails.

Doz. ½ wt. ; doz. full wt.; pound B. or P.

Inch..	⅜	3½-8	4-8	4½-8	⅝	5½-8	6-8	7-8
Per lb.	51	43	35	31	29	27	25	23
	1	1⅛						
	21	19						

Discount, 60, 10 and 2%.

Common and patent brads.

inch.	Price per doz. ½ wt.	Price per doz. full wt.	Price per lb. in papers or bulk.
2-8.....	.50	1.00	1.25
3-8.....	.60	1.20	.80
4-8.....	.65	1.30	.58
5-8.....	.72	1.44	.48
6-8.....	.80	1.60	.36
7-8.....	.90	1.80	.30
1.....	1.00	2.00	.26
1⅛.....	1.12	2.24	.25
1¼.....	1.26	2.52	.24
1⅜.....	1.82	3.64	.22
1¾.....	2.25	4.50	.20
2.....	2.43	4.86	.18

Dis. 60, 10 and 2%.

Oils. LUBRICATING.—Fiske Bros.

Lubroleine A cylinder oil 50 in. barrels.
Lubroleine D cylinder oil 40 in. barrels.
Lubroleine A machine oil 45 in. barrels.
Lubroleine B machine oil 35 in. barrels.
Lubroleine A engine oil 50 in. barrels.
Lubroleine B engine oil 40 in. barrels.
In cases 5c gal. extra.

Crescent Axle Grease.—Barrels, 3c per lb; 100-lb. kegs 3½c lb.; 2-lb. decorated tins, $12, gross less 5 per cent.

Texas Star Axle Grease.—Barrels, 2½c per lb.; 10-lb. kegs, 3c per lb.

See Axle Grease, page 2.

Oil Stoves.

Burns 8 hours; holds 1 quart

Nickel plated crown plate, per doz. $12.

Packing. SELDEN'S PATENT.

For Steam, Air, Water and Ammonia.

With Rubber Core, 60 cents per lb.

Dis., 25 and 5%.

With canvas core, 50 cents per lb.

Dis., 30 and 5%.

Hine & Robertson.

Eureka, 75c. per lb. Dis., 40%.

Soapstone—Standard, 8c. per lb.

XX. 11c. per lb.

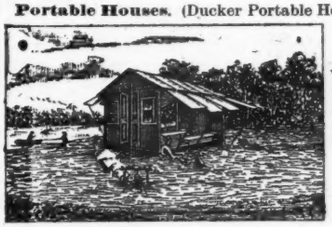
Crown—No. 1, 23c. per lb.

No. 2, 26c. per lb.

Climax, 9c. per lb. Net.

See Rubber Packing, page 7.

Portable Houses. (Ducker Portable House.



Weight, 450 lbs.

Price, $150.

Closes securely.

Dis., 10%.

Weight, 85 lbs. per section.

Price, $220.

Dis., 10%.

No. 10.—26 × 33 ft., including veranda and rear extension. Main part, 19 × 26 ft.....$500.00

Post Hole Diggers.

Chieftain Hay Rake Co.

Little Giant.....	$36.00	doz 11 cu ft.
Hercules.....	30.00	" " " "
New Champion....	20.00	" " " "
Scheidler.....	36.00	" " " "

Dis. 40% f.o.b. New York or Boston.

Press.

Combined press for cutting, forming, horning and seaming.

Particulars of flat front presses, including beds, slides, bolsters, plates, etc.

Prices are net, delivered on steamers in New York, including insurance, etc.

Nominal size of press.....	41	42	43	44	45
Price, including et ceteras.....	$130	$200	$260	$420	$660
Weight, about.....lbs	600	1050	1900	3600	7200
Greatest distance that can be wired.....ins	5	7	10	14	20
Greatest depth that can be wired.....ins	8	10	13	16½	20
Hole through bed—circle intersecting.....ins	4½	6	8¼	12	17
Hole through back—width.....ins	8	9½	12	15½	20½
Width between die clamps—clear.....ins	8	11	15	20	27
Distance back from center of slide bar.....ins	4½	5½	7	9	12
Height to slide-bar, when up..ins	5¼	6½	7¼	8¼	9
Stroke of slide-bar.....ins	1	1¼	1½	1¾	2
Adjustment of slide-bar.....ins	1	1¼	1½	1¾	2
Diameter of fly-wheel.....ins	20	26	32	38	44
Width of fly-wheel.....ins	3	4	5	6	7
Weight of fly-wheel, about....lbs	125	250	420	725	1100
Speed per minute, about.....rev	120	110	100	90	80
Cubic feet boxed, about.....	30	40	50	60	70

Printers' Sundries.

Vanderburgh, Wells & Co.
And Liberty Machine Works.

Wood rules, 12 cents per yard.
Wood rules, on end wood, 15 cents per foot.

EUREKA STAND.
12 full cases.

Price without cases.....$12.00
Boxing and cartage..... 1.25

SHOOTING STICKS.

Each.
No. 1, 75c.
No. 2, $1.
No. 4, 45c., black.
No. 4, 60c., bright.
No. 5, 60c., black.
No. 5, 75c., bright.

GAUGE PINS—ALL SIZES.

Brass, 40c. doz. | Steel, 60c. doz.
Wire, 25c. doz. | Golden, 40c. doz.

MITRE BOXES.

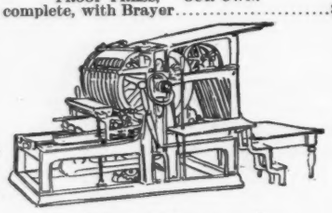
Regular size, 2 in., 50c. each.
Extra size, 3½ in., 75c. each.

LEAD CUTTER.

Curtis' Lead Cutter $2.00

PROOF PRESS, "OUR OWN."

9 × 32, complete, with Brayer $28.00



THE "LIBERTY" CYLINDER PRESS.
For Newspaper and Job Printing.

	Bed.	Form.	
No. 5	29 × 42	24 × 40	$1,200
6	33 × 47	28½ × 45	1,300
7	37 × 51	33 × 49	1,600

Dis., 20 and 5%

THE "LIBERTY" JOB PRINTING PRESS.

	Size of chase.	
No. 2	7 × 11	$200
2a	9 × 13	250
3	10 × 15	300
3a	11 × 17	350
4	13 × 19	400
5	14½ × 22	500

Dis., 12½ and 5%.

Two sizes built extra strong for boxmakers, embossing, etc.

No. 3a—11 × 17 ..... $375
4 —13 × 19 425

Dis., 12 and 5%.

Fountains, either size, $25 extra, if ordered with press.
Steam fixtures, either size, $15 extra.

THE AMERICAN CARD AND BILL HEAD PRESS.

No. 5—4 × 6 ..... $16
7—6 × 9 36
8—8 × 12 61

Dis., 20% and 5%.

THE "LIBERTY" PAPER CUTTER.

Cuts 30 inches $140.00
Extra knife 18.8

Dis., 12½ and 5%.

THE "LIBERTY" IMPOSING TABLES

Marble top.

No. 1	24 × 36	$24
2	32 × 48	38
3	26 × 74	44
4	36 × 48	48

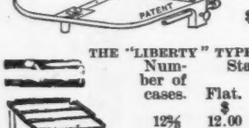
Dis., 12½ and 5%.

Slate Top.

No. 1—24 × 36 ..... $18
2—32 × 48 25
3—26 × 74 32

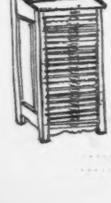
Dis., 12½ and 5%.

Kelsey & Co.,



The Eagle Card and Paper Cutter, 24½ inch, $12 each, $100 per doz.

THE "LIBERTY" TYPE CABINETS.



Number of cases.	Stained. Pine. Flat.	Stained. Pine. Galley.*	Stained. Cherry. Flat.	Stained. Cherry. Galley.*	Grained. Napanoch. Flat.	Grained. Napanoch. Galley.*	Grained. Walnut. Flat.	Grained. Walnut. Galley.*
	$	$	$	$	$	$	$	$
12⅞	12.00	14.50	14.00	17.00				
16⅝	15.00	17.50	17.00	20.00				
18⅝	16.50	19.00	18.50	21.50				
20⅝	18.00	20.50	20.00	23.00				
12¾	15.00	17.50	17.00	20.00				
16¾	18.00	20.50	20.00	23.00				
18¾	19.50	22.00	21.50	24.50				
20¾	22.00	24.50	23.00	26.00				
12 full	18.00	20.50	20.00	23.00				
16 "	22.00	24.50	24.00	27.00				
18 "	24.00	26.50	26.00	29.00				
20 "	26.00	28.50	28.00	31.00				

Number of cases.	Pine. Flat.	Pine. Galley.*	Cherry. Flat.	Cherry. Galley.*	Napanoch. Flat.	Napanoch. Galley.*	Walnut. Flat.	Walnut. Galley.*
	$	$	$	$	$	$	$	$
12¾	18.00	21.00	20.00	23.00	22.00	25.00	23.00	26.00
16⅝	22.00	25.00	24.00	27.00	26.00	29.00	27.00	30.00
18⅝	24.00	27.00	.....	.....	.....	.....	.....	.....
20⅝	26.00	29.00	28.00	31.00	30.00	33.00	31.00	34.00
12¾	21.00	24.00	23.00	26.00	25.00	28.00	26.00	29.00
16¾	25.00	28.00	27.00	30.00	29.00	32.00	30.00	33.00
18¾	27.00	30.00	.....	.....	.....	.....	.....	.....
20¾	29.00	32.00	31.00	34.00	33.00	36.00	34.00	37.00
12 full	24.00	27.00	26.00	29.00	28.00	31.00	29.00	32.00
16 "	28.00	31.00	30.00	33.00	32.00	35.00	33.00	36.00
18 "	30.00	33.00	.....	.....	.....	.....	.....	.....
20 "	32.00	35.00	34.00	37.00	36.00	39.00	37.00	40.00

—*Furnished with galley top and extra drawer for copy.

Dis., 20 and 5%.

THE "LIBERTY" CASE STANDS AND RACKS.

Stands.

Single, without racks	$3.75
" with racks for 8 full cases	4.00
Single, with racks for 10 full cases	4.25
Single, with racks for 12 full cases	4.50
Single, with racks for 14 full cases	4.75
Double, without racks	4.25
" with racks for 8 full cases	4.50
Double, with racks for 16 full cases, and gal. rest	6.25
Double, with racks for 20 full cases and gal. rest	6.50
" " " " 24 " " " " "	6.75
" " " " 24 ⅝ cases	5.25
" " " " 8 full and 8 ⅝ cases	5.00
" " " " 8 " " 8 ¾ "	5.25
" " " " 10 " " 12 ⅝ "	5.55
" " " " 12 " " 16 ⅝ "	5.70
" " " " 12 " " 16 ¾ "	6.05
Stands with closed ends, extra	2.00
Extra slides for stands, each	.00

Case Racks.

Cases.	Inches High.	Inclosed Back and Price.	Inclosed Back and Sides.	Cases.	Inches High.	Inclosed Back and Price.	Inclosed Back and Sides.
12	41	$6.00	$8.50	30	84	$10.00	$13.50
16	50	7.00	9.50	32	51	12.50	16.00
20	60	8.00	11.00	40	60	14.00	17.50
24	70	9.00	12.00	60	84	18.00	23.00

Dis., 20 and 5 %.

THE "LIBERTY" GALLEYS.

All brass "indestructible."

Single,	3⅛ x 23¾ inside	$2.50
"	3¾ x 15¾ "	2.00
"	3¾ x 11¾ "	1.75
Medium, 5 x 23¾ inside		2.75
Double, 6¼ x 23¾ inside		3.00

Dis., 33⅓%.

SMOOTH LINED NEWS GALLEYS.

Half-lined.	Full-lined.	Half-lined.	Full-lined.
Single col. $1.75	$2.00	Double col. $2.00.	$2.50

Dis., 20% and 5%.

SCREW GALLEYS.

	Unlined.	Half-lined.	Full-lined.
Single column	$1.25	$1.50	$1.75
Double column	1.50	1.75	2.00

Dis., 20% and 5%.

SMOOTH LINED JOB GALLEYS.

Size.	Unlined.	Full-lined.	Size.	Unlined.	Full-lined.
6 × 10	$1.25	$2.00	12 × 18	$2.50	$3.50
8¼ × 13	1.50	2.50	14 × 20	3.00	4.00
9 × 14	1.75	2.75	15 × 22	3.50	5.00
10 × 16	2.00	3.00	18 × 25	4.00	5.50

Dis., 20% and 5%.

RULED GALLEYS.

These have a rule laid out on one of the rims, divided into quarter inches, by which to set advertisements. Cost of ruling extra, 25 cents.

Dis., 20% and 5%.

MAILING GALLEYS.

Zinc bottom, 50 cents; brass bottom, 90 cents. Brass closed both ends, $3.

Dis., 20% and 5%.

GALLEY RACKS.

From $3 up.

LEAD CUTTERS,
From $2 up.
Dis. and 5%.

THE "LIBERTY" TYPE CASES.

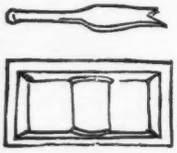
Name.	Outside Measurements.
Full size	32¼x16⅛x1 9-16
Rooker size	28⅛x14¼x1 9-16
¾ size	26x13⅛x1⅝
⅝ size	22⅝x16⅛x1⅝
Enlarged size	32¼x23x2 3-16
Wood type "	32¼x23x1 9-16
Mammoth "	44x23x1 9-16

Cabinet case sides extend 1½ to 3 inches. In ordering cabinet cases, state whether high or low fonts are wanted.

	Without Pat. Clasps.	With Pat. Clasps.
News, full, per pair	$1.60	$1.75
" Rocker, "	1.60	1.75
" ¾ "	1.50	1.60
" ⅝ "	1.40	1.50
German, full, "	1 60	1.75
Music " "	2 00	2.20
Job " "	.90	1.00
Job, full size, California	.90	1.00
" Rooker	.90	1.00
" full, Yankee	.90	1.00
" ¾ Regular	.80	.90
" ⅝ Yankee	.75	.85
" " Boston	.75	.85
" " California	.75	.85
" " improved	.90	1.00
" full size, Middletown	1.20	....
" " Paterson	.90	....
" " New York	.90	1.00
Quadruple, full size	1.20	....
Double lower, "	1.20	....

Name.	Without pat. clasps.	With pat. clasps.
Galley lower, full size	$1.10	
Enlarged Yankee job	2.20	
Enlarged German	2.20	
Founder's sort case	2.20	
Half-cap	.50	
L. S. lead, full-size	1.00	
" rule "	1.15	$1.25
" " ¾ size	.95	1.05
" " ⅝ "	.80	.90
Improved, ⅞ "	.90	1.00
Space and quad, full-size	1.00	
Slug "	1.00	
Figure "	.90	
Triple "	.90	1.00
Improved triple "	.90	1.00
Triple, ¾ size	.80	.90
Blank, full-size	.65	
" ¾ size	.55	
" ⅝ size	.50	
Script, full-size	.90	
" ¾ size	.80	
" ⅝ size	.75	
Wood type, 23x32¼	1.10	
Mammoth, 23x44	1.30	
Metal furniture, full-size	1.25	
Border "	1.25	
" ⅝ size	1.00	
Leader, ⅝ size, per pair	1.40	
Butler jobs, full-size, per pair	3.00	
For pulls on cabinet cases add per case	.10	
For rollers " "	.30	

Dis., 25 and 5%.



THE "LIBERTY" STEEL SHOOTING STICKS.
Bright, $1 each.
Nickelplated, $1.25 each.
Dis., 40%.

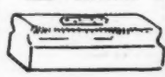
STANDARD METAL FURNITURE
25c. a pound.
In fonts of 25, 50, 75 and 100 lbs.
Dis., 12½.

THE "LIBERTY" MALLETS.

Hickory, small	$ .20
" medium	.25
" large	.30
" iron bound	1.00
Lignum Vitæ, No. 4	.30
" " No. 3	.40
" " No. 2	.50
" " No. 1	.70

Dis. 20 and 5%.

THE "LIBERTY" PLANERS AND PROOF PLANERS.



Midget planer	10c.
Small Maple	20c.
Large "	25c.
" b'k'ed with leather	30c.
Midget " "	12c.
Proof planer, faced with cloth,	50c.

Dis., 40%.

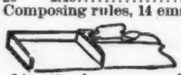
COMPOSING STICKS.

GROVER'S PATENT AND UNION.

	Screw or News.
6 in.,	$ .90
8 "	1.10
10 "	1.20
12 "	1.40
14 "	1.60
16 "	1.80
18 "	2.00
20 "	2.20

Composing rules, 14 ems pica and under, 25 cents.

THE "LIBERTY" COMPOSING STICKS.



Grover.

6 in., Steel	$ .90	16 in., Steel	$1.80
8 "	1.00	18 "	2.00
10 "	1.20	20 "	2.20
12 "	1.40	Extra Clasp	.10
14 "	1.60	Extra Knee	.40

Screw.

6 in., Steel	$ .75	16 in., Steel	$1.45
8 "	.80	18 "	1.60
10 "	1.00	20 "	1.75
12 "	1.15	Extra Knee	.30
14 "	1.30	" Screw and Nut.	.10

Dis., 40%.

Yankee.

6-in., Steel	$ .75	12 in., Steel	$1.15
8 "	.80	Extra Knee	.30
10 "	1.00	" Clamp and Screw	.15

Other Sizes to Order.
Dis., 40%.

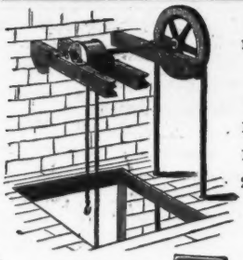
Albion.

6-in., Steel	$1.00	6-in, German Silver	$1.50
8 "	1.10	8 " " "	1.75
Extra Knee	.40	Extra Screw and Nut.	.10

Pulley Blocks.

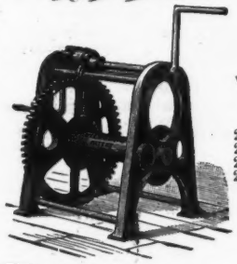
WESTON DIRECT.

	Each.
⅛ ton	$10
¼ ton	13
½ ton	15
1 ton	20
1½ tons	25
2 tons	30
3 tons	40
Geared.	
1 ton	35
2 tons	45
3 tons	60
4 tons	80
5 tons	110
6 tons	150
8 tons	210
10 tons	275



DOUBLE LIFT HOISTS FOR HATCHWAYS, ETC.

500 lbs.	$25.00
1000 "	50.00
1500 "	65.00
2000 "	80.00
500 "	30.00



WESTON CRAB SAFETY BRAKE, HANDLES CANNOT FLY BACK.

	Each.
21	$35.00
22	45.00
23	65.00
25	100.00

Pumps.

Prices on all pumps include cylinders.

No.	Dia. Cyl.	Suction.	Cap. stroke.	Price Iron.	Brass cyl.
0	2 in.	1 in.	1-15 gal.	$3.50	.....
1	2¼ "	1 "	1-12 "	4.00	$6.00
2	2⅝ "	1¼ "	1-11 "	4.50	7.00
3	2½ "	1¼ "	1-10 "	5.00	8.00
4	3 "	1¼ "	1-6 "	5.50	10.00
5	3¼ "	2 "	1-5 "	6.50	14.00
6	3½ "	2 "	1-4 "	8.00	18.00
7	4 "	2½ "	1-3 "	12.00	20.00

Dis., 65%.

1	2¼ in.	1¼ in.	1-10 gal.	4.25	.....
2	3 "	1¼ "	1-7 "	4.75	.....
3	3¼ "	1½ "	1-5 "	5.25	.....
4	4 "	1½ "	1-4 "	5.75	.....
5	4½ "	1½ "	1-3 "	6.25	.....

Dis., 70%.

Standard and Cylinder for 1¼ in. Iron Pipe, $16.00. Dis., 55%

No. 6½, standard and cylinder, 1¼ in pipe, $13.00.
No. 7½, standard and cylinder, 1¼ in. pipe, $15.00.
No. 8½, standard and cylinder, 1½ in. pipe, $18.00.
With hose and discharge pipe, add $3.00 to list price.
Dis., 55%.

No. 1, diam. cyl., 2½ in.; cap. stroke 1-8 gal.; size pipe, 1¼ in. Price, iron, $12.50; brass cyl., $17.50.
No. 2, diam. cyl., 3 in.; cap. stroke, 1-6 gal.; size pipe, 1¼ or 1½ in. Price, iron, $14.50; brass cyl., $18.50.
No. 3, diam. cyl., 4 in.; cap. stroke, 2-5 gal.; size pipe, 1½ or 2 in. Price, iron, $23.50; brass cyl., $34.50.
Dis., 55%.

No. 1, diam. cyl., 3 in.; suction, 1¼ in. cap. stroke, 3-10 gal. Price, iron, $28.00; brass cyl., $58.00.
No. 2, diam. cyl., 4 in.; suction, 1½ in.; cap. stroke, 1-2 gal. Price, iron, $32.00; brass cyl., $60.00.
No. 3, diam. cyl., 5 in.; suction, 2 in.; cap. stroke, 6-7 gal. Price, iron, $35.00; brass cyl., $90.00.
No. 4, diam. cyl., 6 in.; suction, 2½ in.; cap. stroke, 1 1-5 gal. Price, iron, $45.00; brass cyl. $120.00.
Dis., 45%.

No.	Diam. cyl.	Cap. stroke.	Stroke.	Pipe.	Price.
0	2 in.	1-11 gal.	7 in.	1 in.	$21.50
00	2½ "	1-7 "	7 "	1¼ "	23.00
1	3 "	1-5 "	7 "	1½ "	25.25
2	3⅛ "	1-3 "	7 "	1½ "	27.25
3	4 "	4-10 "	7 "	2 "	30.50
3½	4½ "	1-2 "	7 "	2 "	37.50
4	5 "	8-10 "	10 "	2½ "	44.00
4½	5½ " 1		10 "	2½ "	47.00
5	6 " 1	1-5 "	10 "	3 "	50.00

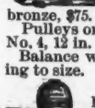
Dis., 40%.

No.	Diam. cyl.	Cap. stroke.	Diam. pipe.	Price. Iron.	Br's cyl.
1	2 in.	1-5 gal.	1 in.	$39	$51
2	2½ "	1-3 "	1¼ "	41	56
3	3 "	1-2 "	1½ "	45	62
4	3½ "	6-7 "	2 "	51	81
5	4 "	7-8 "	2 "	63	114
6	4½ " 1	"	2 "	80	155

Dis., 40%.

With Tight and Loose Pulleys.

No. 1, cap. per rev., 1-6 gal.; size of pipe, 1¼ in.; price, iron, $26; bronze, $45.
No. 2, cap. per rev., 1-5 gal.; size of pipe, 1½ in.; price, iron, $31; bronze, $55.
No. 4, cap. per rev., 1-3 gal.; size of pipe, 2 in.; price, iron, $48; bronze, $75.
Pulleys on Nos. 1 and 2 are 8 in. diam., 2½ in. face; on No. 4, 12 in. diam., 3½ in face.
Balance wheels for above pumps. $1, $2, and $3, according to size.
Dis., 45%.



No. 2, ⅛ to 2 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive, ¾ in.; discharge, ⅝ in.; price, $9.
No. 3, 1 to 4 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive, 1 in.; discharge, ⅞ in.; price, $11.
No. 4, 2 to 8 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive 1½ in; discharge 1⅛ in; price $14
No. 5, 3 to 14 gal, per min.; length of drive pipe, 25 to 40 ft.; calabre of pipes, drive 2 in; discharge 1 in; price $22.
No. 6, 4 to 25 gal. per min.; length of drive pipe, 30 to 40 ft.; calibre of pipes, drive, 2½ in.; discharge, 1¼ in.; price, $40.
No. 7, 8 to 60 gals. per min.; length of drive pipe, 30 to 40 ft.; calibre of pipes, drive, 4 in.; discharge, 2 in.; price, $75.
No. 8, 12 to 120 gal. per min.; length of drive pipe, 30 to 50 ft.; calibre of pipes, drive, 6 in.; discharge, 2¼ in.; price, $125. Dis., 45%.

Railroad Dumping Cars and Carts.

A. C. McEWEN.

Cars.	Gauge.	Cap.	Net	Cap.	Net	Cap.	Net.
Side Dumping	24"	1 c. y.	$55	2 c. y.	$65	3 c. y.	$75*
End "	"	"	55	"	65	"	75*
Revolving "	"	"	70	"	80	"	90*
Bottom "	"	"	80	"	90	"	100*
Tunnel.	"	"	55	"	65	"	75*
Mine...	"	"	50	"	60	"	70*
Plantation....	30"		43				
"	36"		170				
"	4' 8½"		185				
Hand.....	36"		45				
"	4' 8½"		50				
Push.....	36"		40				
"	4' 8½"		45				
R.R. Construction	36"		60				
"	4' 8½"		65				
Carts.							
Plantation and Railroad.....			45 to 75				
Wagons.							
McEwen Patent Dumping....	.....	1 "	175	1½ "	200		

*These cars built of any gauge from 18" to 56½" and of ny capacity from ½ to 6 cu. yd.

Rat Traps.

TOMMINS & ADAMS.

1 doz. in box.

1 gross in case.

$30 per gross.

Dis. 50 and —0%.

Refrigerators.

Indurated Fibre and Stoneware-Lined.

No. 35. Nos. 75, 85.

No.	High.	Wide.	Deep.	Price.
35.....	46¼	28¾	20¼	$30.00
75.....	44¼	33¼	23½	28.00
85.....	47¾	38	23½	34.00

No. 2. No. 6.

No.	High	Wide.	Deep.	Price.
2.....	41	46	26	$36.00
6.....	84	46	26	60.00

Mirror 16 by 18 in. Dis., 30 and 5%.

Roofing.

Thompson Mfg. Co.

CORRUGATED IRON.

2½ inch corrugations.

Gauge.	Per square.
No. 18, painted red.....	$9.10
No. 20, " "	7.60
No. 22, " "	6.50
No. 24, " "	5.35
No. 26, " "	4.65
No. 27, " "	4.35
No. 28, " "	4.00
No. 18, galvanized.....	13.30
No. 20, "	10.60
No. 22, "	9.10
No. 24, ...	7.45
No. 26, galvanized.....	7.05
No. 27, "	6.95
No. 28, "	6.75

Dis., 10%. F. o. b. N. Y.

Slate.

F. o. b. New York. Stowage allowed.

Purple and Green, per 100 feet sq	$4.50
Dark blue, per 100 feet sq	4.10

Sizes, 24 × 12 = 115 to sq., 650 lbs. weight.
Sizes, 20 × 10 = 170 to sq., 650 lbs. weight.

Sash Chains. Phosphor Bronze Smelting Co.

No. A. "Giant" metal, 15c. pr. ft., wts. not over 125 lbs.
No. 1. "Giant" metal, 12c. pr. ft.,wts. not over 75 lbs.
No. 2. "Giant" metal, 10c. pr. ft., wts. not over 40 lbs.
No. 0. "Giant" metal, 8c. pr. ft., wts. not over 25 lbs.
No. 1. Red metal, 10c. pr. ft., wts. not over 40 lbs.
No. 2. Red metal, 8c. pr. ft., wts. not over 30 lbs.
No. 0. Red metal, 6c. pr. ft., wts. not over 15 lbs.
No. 1. Steel, 8c. pr. ft., wts. not 75 lbs.
No. 2. Steel, 6c. pr. ft., wts. not over 30 lbs.
No. 0. Steel, 4c. pr. ft., wts. not over 15 lbs.
No. 1. Steel, black enameled, 9c. pr. ft., wts. not over 75 lbs.
No. 2. Steel, black enameled, 7c. pr. ft., wts. not over 30 lbs.
No. 0. Steel, black enameled, 5c. pr. ft., wts. not over 15 lbs.
Fastenings for hanging a window of 2 sashes for Nos. 1 and 2 chains, consisting of 4 hooks, 4 rings, 4 sash irons, a set, 18c. per set.
Fastenings for hanging a window of 2 sashes for No. 0 chains, 14c. per set.

Dis. on				
"Giant" metal chain	40	10	10%	
" " Red metal chain.....	40	10	10	10%
" " Steel " "	40	10	10	10%
" " Fastenings.....	40	10	10%	

Scales.—Discount on all scales 50 per cent.

Postal scales.

No. 1, capacity ½ to 9 oz. $3.00.
No. 2, capacity ½ to 12 oz., $4.00.
No. 3, capacity ½ to 34 oz. $6.00
No. 4, capacity ½ oz. to 4 lbs., $8.00

Butter Trip Scales, slab, weights and scoop.

No. 7, ½ oz. to 10 lbs., 10 in.	slab,	without	side beam	$10.50
" " " "	"	with	"	11.50
" 8 " " 20 lbs., 12 in.	"	without	"	12.50
" " " " "	"	with	"	13.50

Tea Scales—All Seamless Scoops.

Capacity.	Scoop.	Capacity.	Scoop.
¼ oz. to 10 lbs.	Tin ..$8.00	¼ oz. to 10 lbs.	Brass . 9.00

Druggists.

Capacity.	Scoop.	Capacity.	Scoop.
1-16 oz. to 8 lbs.	Tin ..$10.00	1-16 oz. to 8 lbs.	Brass..$11.00

Even balance trip scales, seamless scoop, with weights.

No. 1, capacity ½ oz. to 2 lbs., tin scoop, $5.50 brass scoop, $6.50.
No. 2, capacity ½ oz. to 4 lbs., tin scoop, $6.50; brass scoop, $7.50.
No. 2½, capacity ½ oz. to 18 lbs , tin scoop, $11; brass scoop, $12.50.

Counter.

Capacity.	Scoop.	Capacity.	Scoop.
½ oz. to 36 lbs.	Tin ..$10.00	½ oz. to 36 lbs.	Brass..$12.00

Grocer.

Capacity.	Scoop.	Capacity.	Scoop.
½ oz. to 62 lbs.	Tin ... $12.00	½ oz. to 62 lbs.	Brass..$14.00

Meat or Butter Scales, with Slab.

½ oz. to 62 lbs.,	with Single Beam	$14.00
" " " "	Double "	15.00

Patent Boston platform, 13½ in. long by 10 in. wide.

Pillar, 18 in. high, double beam, marked both sides.

With large seamless tin scoop, $25.00
" " " brass " 27.00

Platform scales. Without Wheels.

No.	Capacity.	Platform.	Price.
1	400 lbs.	21½ by 15 inches.	$23.00
2	600 lbs.	25 by 16 "	30.00
3	800 lbs.	25 by 17 "	34.00
4	1,000 lbs.	26 by 17 "	39.00
5	1,200 lbs.	28 by 20 "	45.00
6	1,600 lbs.	29 by 21 "	55.00
7	2,000 lbs.	32 by 23 "	70.00

With Wheels.

No.	Capacity.	Platform.	Price.
1	400 lbs.	21½ by 15 inches.	$26.00
2	600 lbs.	25 by 16 "	33.00
3	800 lbs.	25 by 17 "	38.00
4	1,000 lbs.	26 by 17 "	43.00
5	1,200 lbs.	28 by 20 "	49.00
6	1,600 lbs.	29 by 21 "	60.00
7	2,000 lbs.	32 by 23 "	75.00

Brass sliding poise at same price if so specified in order.

With Wheels and Drop Lever.

No.	Capacity.	Platform.	Price.
4	1,000 lbs.	26 by 17 inches.	$51.00
5	1,200 lbs.	28 by 20 "	59.00
6	1,600 lbs.	29 by 21 "	70.00
7	2,000 lbs.	32 by 23 "	82.00
8	2,500 lbs.	33¼ by 24¾ "	94.00
9	3,000 lbs.	38 by 30 "	125.00

Shears. The Patent "Eureka

No. 1 cuts round metal up to ¼ in. steel to ⅛, $12.

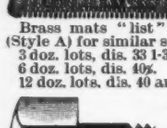
No. 2 cuts round metal up to ⅛ in., steel to 3-16, $20.

Discount, 25%.

Steel Wire Mats.

Galvanized Steel Wire.			(Style A) "Hartman Flexible."
No. 2.	Size 16x24.	Each	$1.50
No. 3.	" 18x30.	"	2.00
No. 4.	" 22x36.	"	3.00
No. 5.	" 26x48.	"	4.50
No. 6.	" 30x48.	"	5.25
No. 7.	" 36x48.	"	6.50
No. 8.	" 36x60.	"	8.00
No. 9.	" 36x72.	"	10.00

Brass mats "list" double the price of galvanized (Style A) for similar sizes.
3 doz. lots, dis. 33 1-3%.
6 doz. lots, dis. 40%.
12 doz. lots, dis. 40 and 5%.

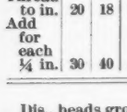


Screws.

STEEL SCREWS ADD 50% TO LIST.
Prices are per 100.
Hexagon Cap Screws.
Heads on Steam-tight Screws not polished, unless so ordered. Can make these 12 inches long.

Diam. head.	7-16	½	9-16	⅝	¾	13-16	⅞	1	1⅛	1¼	1⅜
Length head.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
Diam. screw.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞		1⅛
¾	3.00	3.25	3.75	4.40	5.50	7.00					
1	3.25	3.50	4.00	4.70	5.70	7.00	9.50				
1¼	3.50	3.75	4.25	5.00	6.00	7.50	9.50	12.20			
1½	3.75	4.00	4.50	5.30	6.30	8.00	10.00	12.20	16.00		
1¾	4.00	4.25	4.75	5.60	6.60	8.50	10.60	12.80	16.60	21.20	
2	4.25	4.60	5.05	5.95	7.00	9.10	11.20	13.40	17.20	22.30	29.00
2¼		5.00	5.40	6.35	7.50	9.70	11.90	14.10	17.90	23.60	30.50
2½			5.80	6.80	8.00	10.40	12.70	14.90	18.80	25.10	32.30
2¾				7.30	8.60	11.20	13.60	15.90	20.00	26.90	34.40
3					9.30	12.10	14.70	17.00	21.80	29.00	37.00
Thread to in.	20	18	16	14	12	12	11	10	9	8	7
Add for each ¼ in.	30	40	50	60	80	1.00	1.30	1.60	2.00	2.40	3.00

Dis., heads ground, 60%; dis., heads black, 60 and 5%; dis., heads extra finish, 50%; dis., heads case-hardened, 5%; dis., heads polished after hardening, 45%.



SQUARE CAP SCREWS.

Diam. head.	⅝	7-16	½	9-16	⅝	11/16	¾	⅞	1⅛	1¼	1⅜
Length head.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
Diam screw.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
¾	2.40	2.75	3.20	3.80	4.40	5.75					
1	2.60	2.95	3.40	4.00	4.70	5.75	7.70				
1¼	2.75	3.10	3.65	4.20	4.95	6.05	7.70	10.50			
1½	2.90	3.30	3.85	4.45	5.25	6.35	8.25	10.50	14.00		
1¾	3.05	3.50	4.10	4.70	5.55	6.65	8.80	11.10	14.80	18.00	
2	3.25	3.70	4.35	4.95	5.90	7.05	9.40	11.80	15.70	19.00	22.50
2¼		4.00	4.65	5.25	6.30	7.55	10.10	12.60	16.70	20.20	24.00
2½			5.00	5.60	6.75	8.15	10.90	13.50	17.80	21.50	25.80
2¾				6.00	7.25	8.85	11.80	14.60	19.10	23.10	27.80
3					7.80	9.65	12.80	15.90	20.60	25.00	30.50
Thread to in.	20	18	16	14	12	12	11	10	9	8	7
Add for each ¼ in.	25	35	45	55	65	90	1.20	1.50	1.80	2.30	3.00

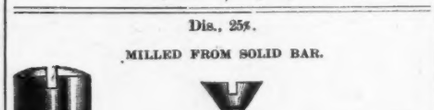
Dis., heads ground, 65%; dis., heads black, 65 and 5%; dis., heads extra finish, 55%; dis., heads case hardened, 60%; dis., heads polished-hardened, 50%.

MILLED HEADS, COLLAR SCREWS

Diameter of Collar.	¼	11/32	7/16	½	⅝	11/16	13/16	15/16	1	1¼
Diameter of Screw.	⅛	3/16	¼	5/16	⅜	7/16	½	9/16	⅝	¾
Length under Head to Point, ¾	2.50	2.80	3.10	3.75	4.40	5.00	6.25			
1	2.80	3.10	3.40	4.05	4.70	5.30	6.60	8.25		
1¼	3.10	3.40	3.70	4.35	5.00	5.60	7.00	8.60	11.25	
1½	3.45	3.70	4 00	4.70	5.30	5.95	7.40	9.00	11.90	15.00
1¾		4.05	4.35	5.05	5.65	6.35	7.80	9.45	12.60	15.60
2			4.70	5.45	6.25	6.85	8.40	10.00	13.35	16.25
2¼				5.95	6.85	7.40	9.00	10.60	14.15	17.10
2½					7.50	8.10	9.60	11.25	15.00	18.00
2¾						8.75	10.30	11.90	15.90	19.00
3							11.00	12.60	16.85	20.00
Threads to inch	40	30	20	18	16	14	12 or 13	12	11	10
Add for each ¼ inch	30	40	50	60	80	1.00	1.30	1.60	2.00	2.40

Dis., 25%.

MILLED FROM SOLID BAR.



Fillister. Bevel Head. Button Head

Diam. Head	3-16	¼	5/16	7-16	9-16	⅝	¾	13-16	⅞	1
Length Head	1/16	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾
Diam. Screw	⅛	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾
¾	2.00	2.25	2.50	3.00	3.50	4.00	5.00			
1	2 25	2.50	2.75	3.25	3.75	4.25	5.30	6.60		
1¼	2.50	2.75	3.00	3.50	4.00	4.50	5.60	6.90	9.00	
1½	2.75	3.00	3.25	3.75	4.25	4.75	5.90	7.20	9.50	12.00
1¾		3.25	3.50	4.00	4.50	5.00	6.20	7.50	10.00	12.50
2			3.75	4.35	5.00	5.50	6.75	8.00	10.75	13.00
2¼				4.75	5.50	6.00	7.25	8.50	11.50	13.75
2½					6.00	6.50	7.75	9.00	12.00	14.50
2¾						7.00	8.25	9.50	12.75	15 25
3							8.75	10.00	13.50	16.00
Threads to inch.	40	30	20	18	16	14	12	12	11	10

Head on Bevel and Button Head Screws, 1-16 larger in diameter than above specifications.
Price, according to size of head.
Discount, 50%; case hardened, 45%; case hardened and polished, 35%.

Soups (French).

	Per dozen. In Cans—Quarts.	Pints.	In Glass. 1½ pt.
Green turtle	$8.00	$4.32	$9.00
Terrapin			
Chicken	3.75	2.25	
Mulligatawny			
Mock turtle			
Ox tail			4.50
Consommé			
Tomato			
Julienne			
Printanier	3.50	2.10	
French bouillon			
Mutton broth			None in glass.
Vegetable			
Beef			
Pea			

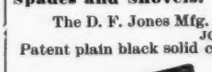
Packed in cases of..... 2 doz. 4 doz. 1 doz.
Regular Assorted Cases. In Cans—Quarts.
2 Chicken, 1 Mulligatawny, 3 Mock Turtle, 3 Ox Tail, 2 Consommé, 2 Tomato, 3 Julienne, 1 Printanier, 1 Mutton Broth, 1 Vegetable, 1 Beef, 2 French Bouillon, 2 Pea. Per doz., $3.55.
In Glass.
11 Chicken, 1 Mulligatawny, 2 Mock Turtle, 1 Ox Tail, 2 Consommé, 2 Tomato, 1 Julienne. Printanier, 1 Mutton Broth.
Terms cash Discounts: 5% for lots of 10 cases, 10% for lots of 25 cases. 15% for lots of 50 cases.

Spades and Shovels.

The D. F. Jones Mfg. Co., of Gananoque (Ld.).

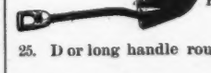
JONES'

Patent plain black solid cast-steel shovels and spades.



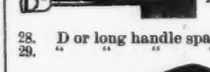
Patent solid steel shovel.

No.		Per Doz. No. Black.	Per Doz. No. Pol'd
20.	D. or long handle sq.-point shovels. 2	$15.50	$16.50
21.	" " " " " " 3	16.25	17.25
22.	" " " " " " 4	17.00	18.50
23.	" " " " " " 6	17.50	19.00
24.	" " " " charcoal. 8	20.50	22.00



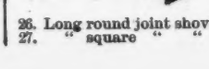
Pt. plain back solid cast steel shovel.

25.	D or long handle round-point shovels. 3	16.25	17.25



Patent solid cast steel spade.

28.	D or long handle spades..... 2	16.00	17.00
29.	" " " " " " 3	16.50	18.00



Patent plain back solid cast steel.

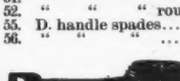
26.	Long round joint shovel No. 2.....	15.50	16.50
27.	" square " " No. 2.....	15.50	16.50

32.	D. handle square-point molders' shovels..... 2	.....	17.00
33.	D. handle square point railroad, extra heavy..... 2	15.75	
34.	D. handle round point railroad, extra heavy 3	16.50	
35.	L. handle round point shovel, with foot cap..... 2	16.00	17.00

GRAY'S CAST.

Patent plain back solid-steel shovels and spades.

50.	D. or long handle sq.-point shovels. 2	$12.00	$13.00
51.	" " " " " " 3	12.75	14.00
52.	" " " " round point " 3	12.75	14.00
55.	D. handle spades..... 2	12.25	13.25
56.	" " " 3	13.00	14.25



Patent solid corrugated cast steel scoop.

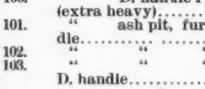
SCOOPS.

Jones' patent plain back solid corrugated cast steel scoops.

90.	D. or long handle solid cast steel...2	$13.50	$14.50
91.	" " " " " " ...4	14.50	15.50
91½.	" " " " " " ...6	16.50	17.50

Jones' riveted scoops.

92.	Cast steel D. or long handle... 2	13.50	14.50
93.	" " " " 4	14.50	15.50
94.	" " " " 6	16.50	17.50
		Half polished.	
95.	" " " " 8		$20.00
96.	" " " " 10		22.50
97.	" " " Locomotive or coal (heavy).....6	17.50	
98.	" Long or D. handle for salt heavy).....	17.50	
99.	" D. handle flour and house furnace.....	10.50	
100.	" D. handle r'd-pt. for coal (extra heavy).....6	20.00	
101.	" ash pit, furnace L. handle.....2		Polished. 13.00
102.	" " " 32 in. D..2		13.50
103.	" " " 42 " iron D. handle.....2		14.00



Ditching spade.

124.	D handle ditching (flat).....	18.00	19.50
125.	D handle post hole (concave).....	18.00	19.50
126.	D handle Alcock (for clay and brick)....	16.00	17.00

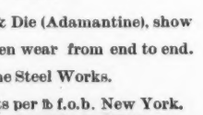
Discount on shovels and spades, 50 and 10.
" " scoops, 50.
Boxed f.o.b. New York, Boston or Montreal.
The solid shovels, spades and scoops are made from cast steel bars by a recently patented process, the blade and strap being in one piece, not welded. All goods are American patterns

Stamp Head Shoes and Dies.

Shoe & Die (Adamantine), showing even wear from end to end.

Chrome Steel Works.

8 cents per lb f.o.b. New York.



Stencil Inks.

Black.

No.	Per can.	Per cake.	No.	Per can.	Per cake.
1	7 cents	3 cents	3	20 cents.	12 cents
2	10 "	5 "	4	30 "	20 "

Blue.

1	10 cents.	6 cents	3	30 cents.	22 cents
2	15 "	9 "	4	50 "	40 "

Red and Green.

1	12 cents	8 cents	3	50 cents.	42 cents
2	20 "	15 "	4	90 "	80 "

Per doz. cans or cakes, net, per gross, 10% less.

Indelible Ink.

Small bottles per	100	$2.75
" "	500	12.00
" "	1,000	20.00

STENCIL COMBINATIONS.
Contains Alphabet, Figures, Brush. and Ink.

⅛ inch, per doz	.....	$5.00
¾ " "	.....	5.40
1 " "	.....	5.75
1¼ " "	.....	7.50
1½ " "	.....	8.40
2 " "	.....	10.00
2½ " "	.....	15.00

Dis., 10%.

Tools. ARTISANS.

Chisel (Mason).

Stone, 5 and 8c. lb., net.

Mill Picks.
Cast steel, 2 to 3 lbs., $22 per doz.
Dis., 60 and 5%.

Stone Axes, Cast Steel.

All sizes, 50c. per lb.

Dis., 70 and 10%.

Five lbs. and over, 40c.; with teeth, 45c.; 3 to 5 lbs., 45c.; with teeth, 50c.; under 3 lbs., 50c.; with teeth, 55c.

Nos. 40 and 41, spalling or stone hammer, 5 lbs. and ver, 36c.; 3 to 5 lbs., 40c.; under 3 lbs., 45c. per lb.

Nos. 40 and 41, spalling hammers, 9 to 20 lbs., steel face, per lb., 17c. Dis., 70 and 10%

Ship or Top Mauls, Steel Face, 4 to 8 lbs., 28c. per lb.

Dis., 50, 10 and 5%..

Steel Wedges, wood, 1st qual., 5c. lb.

Cooper Froes.

8 in..	℔ doz.	$13.00
10 in..	℔ doz.	13.50
12 in..	℔ doz.	14.00
14 in..	℔ doz.	14.50
16 in..	℔ doz.	15.00

Discount, 60%.
60 days, 2% 10 days.

Vise.

No 1. Solid Box Vises.

		Each.
No. 25, 3½ in.	Jaw	$12.00
" 30, 3½	"	11.00
" 55, 3⅞	"	10.00
" 40, 4	"	10.50
" 45, 4¼	"	11.00
" 50, 4¼	"	11.50
" 55, 4½	"	12.00
" 60, 4½	"	13.00
" 65, 4¾	"	14.00
" 70, 5	"	15.00
" 75, 5	"	16.00
" 80, 5¼	"	17.50
" 85, 5¼	"	18.50
" 90, 5½	"	20.00
" 95, 5¾	"	21.00
" 100, 6	"	22.00
" 105, 6	"	23.00
" 110, 6¼	"	24.00
" 115, 6¼	"	25.00
" 120, 6½	"	26.00
" 125, 6¼	"	27.50
" 130, 6¾	"	29.00

		Each.
No. 135, 6¾ in.	Jaw	$31.50
" 140, 7	"	33.00
" 145, 7	"	35.00
" 150, 7	"	36.00
" 160, 7¼	"	41.50
No. 170, 7¼ in.	Jaw	$44.50
" 180, 8	"	47.00
" 190, 8	"	53.00
" 200, 8	"	56.00

Dis., 60 and 10%.

MINERS.

Adze Eye Coal Picks.
Same list and dis. as No. 16.

Anthracite Coal Picks.
Same list and dis. as No. 16.

Stone Picks, per doz.
No. 18, 6 to 7 lbs...$16.50.
No. 18, 7 to 8 lbs... 17.50.
No. 18, 8 to 9 lbs... 18.50.
Dis., 60 and 5%.

No.			Coal Picks.	Per doz.
16,	Weight,	2	lbs.	$8.50
16,	"	2½	"	9.00
16,	"	3	"	9.50
16,	"	3½	"	10.00
16,	"	4	"	10.50
16,	"	4½	"	11.00
16,	"	5	"	11.50
16,	"	5½	"	12.00
16.	"	6	"	12.50
16,	"	6½	"	13.00
16,	"	7	"	14.00

Packages chiarged at cost. Dis., 60%.

Adze Eye Miners Picks—Surface, Drifting and Poll.

No.			per doz.
19,	Surface.	No. 1, 4 lbs.	$14.00
19,	"	No. 2, 4½ "	15.00
19,	"	No. 3, 5 "	16.00
19,	"	No. 4, 5½ "	17.00
19,	"	No. 5, 6 "	18.00
19,	"	No. 6, 6½ "	19.00
19,	"	No. 7, 7 "	20.00
20,	Drifting,	No. 1, 3 "	12.50
20,	"	No. 2, 4 "	14.00
20,	"	No. 3, 4½ "	15.00
20,	"	No. 4, 5 "	16.00
20,	"	No. 5, 6 "	17.50
21,	Poll,	No. 1, 3½ "	15.00
21,	"	No. 2, 4 "	16.00
21,	"	No. 3, 4½ "	17.00
21,	"	No. 4, 5 "	18.50
21,	"	No. 5, 6 "	20.00
21,	"	No. 6, 6¾ "	21.50

Dis., 60, 10 and 5%.

Tamping Picks.

Adze eye, 6 to 7 lbs., per doz., $17.

Adze eye, 7 to 8 lbs., per doz., $18.

Adze eye, 8 o 9 lbs., per doz., $19.

Hunt eye, 6 to 7 lbs., per doz., $17.

Hunt eye, 7 to 8 lbs., per doz., $18.
Hunt eye, 8 to 9 lbs., per doz., $19.
Dis., 60 and 10%.

Ore Picks.

No.			
54, Adze Eye,	5 to 6 lbs.	℔ doz.	$12.00
54, "	6 to 7 "	"	$13.00
54, "	to 8 "	"	$14.00

56, Steel Lake Superior Mining Pick

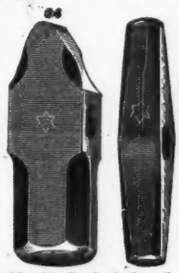
(Special Price and Quality.)

Dis, 60 and 10

Steel Face Hammers.

No. 43, hand drilling hammers, 2 to 5 lbs.; No. 45, napping hammers, 2 to 5 lbs.; No. 39, mason hammers, 3 to 8 lbs.; No. 42, smiths' hand hammers, 2 to 5 lbs.; No. 44, smiths' striking hammers, 2 to 5 lbs., all steel face, per b., 26c. Dis., 70 and 10%.

Steel Face Sledges.



No. 34. Smiths' sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 35. Stone sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 36. Striking sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 37. Coal sledges, 5 to 10 lbs., steel face, 18c. per lb.

Cast Steel Sledges.

No. 34. Blacksmiths' sledge. 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb,
No. 35. Stone sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 36. Striking sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 37. Coal sledge, 5 lbs. and over, 30c.; 3 to 5 lbs. 36c.; under 3 lbs., 45c. per lb.

No. 43, hand drilling hammer, 5 lbs. and over, 36c.; 3 to 5 lbs., 40c.; under 3 lbs., 45c. per lb.
Dis., 70 and 10%.

Cast Steel.

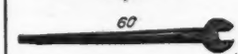
No. 42, blacksmiths' hand hammer, 5 lbs. and over 30c.; 3 to 5 lbs., 34c.; under 3 lbs., 45c. per lb.
No. 44, drilling or striking hammer, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 45, napping hammer, 5 lbs. and over, 30c.; 3 to 5 lbs., 35c., under 3 lbs., 45c. per lb.
Dis., 70 and 10%.

RAILROADS.

Railway Track Punch

Round Point.
15c. lb., net.

Track Wrench.



7¾c. lb., net.

Rail Fork.

9c. lb., net.

Crow Bars.
Wedge Points, 3½c. lb., net.
Pinch Point, 3 ½c. lb., net.

65 Tamping Bar, 6c. lb., net.

66 Claw Bar,
7c. lb., net.

Railroad Spike Mauls 6 to 16 lbs., Steel Face 18c. lb.

Dis., 50, 10, and 5%.

Steel Track Chisel,

15c. per lb., net.

Railroad or Clay Picks.

No.				Per doz.
11,	Adze eye,	4 to	5 lbs.	$11.00
11,	"	5 to	6 "	12.00
11,	"	6 to	7 "	13.00
11,	"	7 to	8 "	14.00
11,	"	8 to	9 "	16.00
11,	"	9 to	10 "	18.00
12,	Hunt eye,	4 to	5 "	11.00
12,	"	5 to	6 "	12.00
12,	"	6 to	7 "	13.00
12,	"	7 to	8 "	14.00

Dis., 60 and 10%.

Mattocks—Price per doz.
2, Adze Eye, Long Cutter, 6 lbs., $16.00.
3, Adze Eye, Short Cutter, 5½ lbs., $15.50.
2, Adze Eye, Long Cutter, Light, $15.00.
3, Adze Eye, Short Cutter, Light, $15.00.
4, Hunt Eye, Long Cutter, 6 lbs., $16.00.
5, Hunt Eye, Short Cutter, 5½ lbs., $15.50.

Adze Eye Pick Mattocks.....$16.

Hunt Eye Pick Mattocks.....$16

Dis., 60 and 10%.

Grub Hoes.

Western Pattern, No. 0, 3 lbs., ℔ doz., $10.50.
Western Pattern, No. 1, 3¼ lbs., ℔ doz., $11.
Western Pattern, No. 2, 4 lbs., ℔ doz., $11.50.
Western Pattern, No. 3, 4½ lbs., ℔ doz., $12.
Baltimore Pattern, No. 1, 3¼ lbs., ℔ doz., $11.
Baltimore Pattern, No. 2, 4¼ lbs., ℔ doz., $11.75
Baltimore Pattern, No. 3, 5 lbs., ℔ doz., $12.75.
Baltimore Pattern, No. 4, 5¾ lbs., ℔ doz., $13.75.
Dis., 60 and 10%.

Stanley Rule & Level Co.

CARPENTERS'.

BOXWOOD RULES.

Two feet, four-fold, 1 inch wide.

Plate.	Middle.	Edge.	Bound.
Round joint	$4	...	...
Square "	5	$7	$15
Arch "	6	8	16

Two feet, four-fold, 1⅝ inches wide.

Plate.	Middle.	Edge.	Bound.
Square joint	$7	$9	$18
Arch "	9	11	20

Two feet, two-fold, 1½ inches wide.

Square joint.	Arch.	Arch Bound.
$5	$7	$16
12	14	24

Gunter's Slide.

Dis. 80, 10 and 10%.

LEVELS.

	10 to 16 in.	18 to 24 in.
Arch top plate, 2 side views	$9.00	$12.00

PLUMBS AND LEVELS.

Arch top plate, 2 side views.

	12 to 18 in.	18 to 24 in.	24 to 30 in.
Polished	$14.00	$16.00	$18.00
Mahogany	....	16.50	22.50
Mahogany tp'd and lp'd	27.00	.....	.....
Polished and l pped	.....	.....	24.00
Polished and tipped	.....	.....	28.00
Polished, lip'd and tip'd	.....	.....	35.00

	in.	
Mason's level, 2 plumbs, polished,	36,	$30.00
Mason's level, 2 plumbs, p'd and t'd,	36,	36.00
Mason's level, 2 plumbs, polished,	42,	36.00

PATENT ADJUSTABLE PLUMBS AND LEVEL.

Arch Top plate, 2 side views	26 to 30 in.
Polished and lipped	$27.00
Polished and tipped	30.00
Polished, lipped and tipped	39.00
Mahogany	27.00
Mahogany, lipped	33.00
Mahogany, lipped and tipped	48.00
Polished, triple stock, lipped and tipped	48.00
Mahogany " " "	60.00
Rosewood, lipped and tipped	90.00

Dis., 70, 10, 10%.

POCKET LEVELS.

Iron top, Japanned	2 50
Brass top	3.00

Dis., 70, 10, 10%.

SCREWDRIVERS.

Varnished handles, pat. metallic fastening. Size 1½, $1 per dozen; 2, $1.50; 3, $2; 4, $2.50; 5, $3; 6, $3.50; 7, $4; 8, $4.75; 10, $6; 12, $8. Dis., 75 %.

BAILEY'S PATENT WOOD PLANES.

Smooth.	Handle smooth.	
9 × 8¾ in.	8 × 2 in.	9 × 2 in.
$2	$2	$2.50 each

Jack.	Fore.	Jointer.
15 × 2⅜ in.	20 × 2¾ in.	20 × 2⅝ in.
$2.50	$2.75.	$3.25 each

Dis., 40, 10 and 10%.

PLANES, BAILEY'S PATENT IRON.

With pat. lateral adjustment.

Smooth, 8 in. × 1¾ in., $3; 9 in. × 2 in., $3.25; 10 in. × 2⅜ in., $3.75 each.
Jack, 14 in. × 2 in., $3.75.
Fore, 18 in. × 2⅜ in., $4.75
Jointer, 24 in. × 2⅜ in., $6.50 each.

Dis., 40, 10 and 10 %.

STANLEY IRON BLOCK PLANES.

3½ × 1 in. 20c.
5½ × 1¼ in. 40c.
7½ × 1¾ in. 60c. each.

ADJUSTABLE.

5½ × 1¼ in. 60c.
7½ × 1¾ in. 85c. each.

Dis., 40, 10 and 10%.

STANLEY'S BEADING, RABBET, SLITTING AND MATCHING PLANE.

Eighteen Tools, Bits, etc.

$8 each. Dis., 20, 10 and 10%.

STANLEY "ODD JOBS."

Embraces in combination with ordinary Carpenters' Rule:

(1) Try square.
(2) Mitre square.
(3) T—— square.
(4) Marking gauge.
(5) Mortise gauge.
(6) Depth gauge.
(7) Mitre level.
(8) Spirit level and plumb.
(9) Beam compass.
(10) Inside square for making boxes and frames.

Price 75 cents.
Dis., 20, 10 and 10%.

Ludlow Valve Co.

Double Gate Brass Valves.

Gland in packing box.

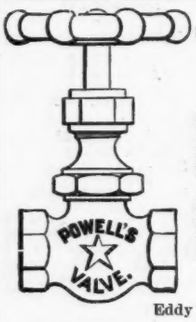
Size.	Screw socket.	Flange.	Diameter of Standard Flange.	Face to face of Screw socket	Face to face of Flanges.	Extra for slide stem and lever subject to discount.
In.	$	$	In.	In.	In.	
⅛	1.25	....	.....	2¼	.....	$1.00
¾	1.65	....	.....	2½	.....	1.00
1	2.15	....	.....	2⅞	.....	1.00
1¼	3.15	....	.....	3⅜	.....	1.00
1½	4.25	....	.....	3¾	.....	1.00
2	6.25	11.50	6	4½	4⅝	1.00
2½	11.50	18.00	6½	4 13-16	5⅛	1.25
3	16.00	22.00	7	5	6¼	1.25
3½	21.00	31.00	7½	.....	.....	1.25
4	35.00	43.00	9	.....	7 1-16	1.25
5	52.00	64.00	10	.....	.....	1.25
6	78.00	90.00	11	.....	9	1.25
8	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....	.....

Rubber-Faced Slide Gate Fire Hydrant.

Diameter of pipe connection.	Diameter of stand pipe.	Diameter of seat ring.	One 2½ nozzle.	Two 2½ nozzles.	Three 2½ nozzles.
Inches.	Inches.	Inches.			
3 or 4	4½	3	$28	.....	.....
3—4—6	5¾	4	31	$33.00	$35.00
4 or 6	7	5	.....	38.50	40.50
6 or 8	8	6	.....	49.00	51.00
8 or 10	10	8	.....	.....	.....

Four 2½ nozzles.	Six 2½ nozzles.	One steamer nozzle.	One steamer and one 2½ nozzle.	One steamer and two 2½ nozzles.	Front case, standard length.
.....	.....	$33.00	$35.00	$37.00	$4.50
.....	.....	38.50	40.50	42.50	5.00
$53.00	.....	49.00	51.00	53.00	6.50
.....	.....	.....	.....	.....	7.50

For each 6 inches more or less than standard length of stand pipe, add or deduct from list.	For each 6 inches more or less than standard length of frost case, add or deduct from list.	Extra charge for hub.	Independ't nozzle gates each.
$0.60	$0.44	.....	.....
.75	.50	6 in. $0.50	$3.50
.85	.70	No ch'ge	3.75
1.00	.90	8 in. $1.25	3.75
.....	.....	.....	4.50



Star Radiator Valves, with Brass T Handles or Wood Wheels.

Size, inches....	½	¾	1
Plain brass	$1.60	$2.00	$2.50
Plated trim'gs.	1.80	2.25	2.80
Rough & Plat'd	2.00	2.45	3.05
Finish'd & P'l't.	2.50	3.00	3.65

Size, inches....	1¼	1½	2
Plain brass.....	$3.60	$4.80	$7.50
Plated trim'gs.	3.95	5.20	8.00
Rough & Plat'd	4.20	5.50	8.50
Finish'd & P'l't.	4.95	6.50	9.75

Dis., 40, 10 and 5%.

Eddy Valve Co.

EDDY VALVES.

S. S. & O. S. Class L. & Y. 2.

Cl'ss 3 and 4. 4.

Class 2. Iron, brass mounted. Size.	Screw, or flange ends.	Add for S S&L	Class 3. All ir'n for gas. Hub. ends.	Class 4. Water works valves. Hub ends.	Class 5. Quick opening valves with rack and pinion stem. Iron, brass mounted. Hub ends.	Screwed.	Flanged.
½	$7.00	$1.00	$8.00	$10.00	$10.00	$9.00	$9.00
2½	10.50	1.30	.....	.....	15.00	14.00	14.00
3	13.00	1.40	10.00	15.00	20.00	17.00	17.00
3½	16.50	1.50	.....	.....	25.00	21.00	21.00
4	18.00	1.70	15.00	18.00	30.00	25.00	25.00
4½	22.00	1.80	.....	.....	.....	.....	.....
5	25.00	2.00	20.00	25.00	35.00	31.00	31.00
	31.00	2.30	25.00	31.00	40.00	37.00	37.00
	37.00	2.70	30.00	37.00	.....	.....	.....
	45.00	3.00	35.00	45.00	55.00	55.00	55.00
	60.00	3.50	48.00	60.00	.....	.....	.....
	80.00	4.00	65 00	80.00	.....	.....	.....

All Iron Valves, Classes 2 and 5, 10 per cent. less than Brass Mounted.

Varnish.

Edward Smith & Co.

For Finishing Coats.	gal.
Wearing body varnish	$5.50
Medium drying body	5.50
One coat coach varnish	4.50
Wearing carriage	4.50
Heavy gear varnish	4.00
Coach body "	4.00
No. 1 coach "	2.25

For Under Coats.

Hard drying body	$4.50	Black rubbing varnish	$4.00
Rubbing body varnish.	4.00	Priming (1st coat)	2.50
Quick rubbing "	3.50	Filling (2d coat)	2.50
		Rough stuff	2.50

For Inside Work.

Best flowing varnish	$4.50	Hard oil finish light	$2.75
Best polishing "	4.50	" dark	2.25
Cabinet "	3.00	White copal	4.00

Dryers.

Japan gold size	$3.50	Brown japan	$1.25
Coach japan	1.75	Liquid dryer	1.25

Discount, 40 per cent. f.o.b. N. Y.

Preservative Coatings.

Spar coatings	$4.00	Exterior car coating	$4.00
I. X. L. No. 1	2.50	Interior car coating	3.25
I. X. L. No. 2	4.00	Locomotive coating	4.00
Floor finish	2.50		

Discount, 35 per cent, f.o.b. N. Y.

Wheelbarrows.

Climax Bolted Barrow, with Wood Wheel per doz. $22.50. 1½ tire of iron.

Common Nailed Barrow per doz.	$18.50.			
" Bolted " " "	18.75.			
Lansing's Patent Iron-Bolted Barrow,	per doz.,			$25.50
Capital Patent Bolted Dirt	"	"	"	30.00
Red oak or Government	"	"	"	40.50
Wharf	"	"	"	72.50
Mortar	"	"	"	30.00
Bent Handle Stone	"	"	"	48.00
Coal or Ore	"	"	"	31.50
Pig Metal or Casting	"	"	"	40.50
Brick Yard 20 inch Iron Wheel	"	each		10.50

Globe Patent Bolted Garden Barrow } per doz., 42.50.
Box 30 by 24 by 12 deep, wood wheel }

Capita Patent Barrows

With Iron Tray, A, per doz.,	$39.00
" " " B, " "	42.00

The Leader Iron and Steel Barrows.
Gas-pipe Legs and Handles in one price.

No. 1 Tray of 16 iron, capacity	3 cu. ft. of earth, each	$12.
No. 2 " " 14 " "	5 " " " "	
or 250 lbs. of coal		" 15
3 Galvanized 18 iron, capacity same as No. 2		" 15

Whiffletree.

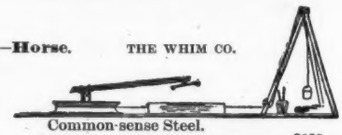
JAFFERY MFG. CO.

Willson spring Jeffery Manufacturing Company.

	Single.	Double.
No. 1, 34 or 36 inches long	$1.25	$2.50
No. 2, " " "	1.40	2.75
No. 3, " " "	1.50	3.00
No. 4, " " "	1.65	3.25

Including either steel hooks or rings
Discount, 45 and 5%.

Whims—Horse. THE WHIM CO.



Common-sense Steel.

F. O. B. $125

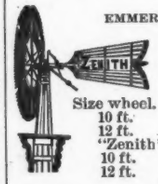
Dis., 25%., in car lots.

Windmills.—Industrial Mfg. Co.

10 ft. pumping	$75	Plus cost of packing.
12 ft. "	95	
14 ft. "	140	
16 ft. "	225	

Dis., 50 per cent.

EMMERT & LAMB.



"Stover" Pumping Windmills (no tower).

Size wheel.	Wt. packed.	Cubic ft.	Price.
10 ft.	650	50	$80.00
12 ft.	750	58	100.00

"Zenith" Pumping Windmills (no tower).

10 ft.	650	48	85.00
12 ft.	750	57	110.00
Dis., 50 per cent.			
14 ft.	1,400	108	160.00
16 ft.	1,600	114	250.00
Dis., 45 per cent.			
20 ft.	2,950	220	400.00
25 ft.	4,225	280	600.00
Dis., 40 per cent.			

"Zenith" Geared Windmill (no tower).

Prices include upper set of Gears and about 5 feet vertical extra heavy shaft in windmill head.

14 ft.	1,550	178	260.00
16 ft.	1,780	198	300.00
20 ft.	3,170	216	500.00
Dis., 40 per cent.			

Wire Rope. JOHN W. MASON & CO.

Circumference in inches.	Diameter in inches.	Price in cents per foot best crucible cast steel rope. 19 wires to strand.	7 wires to strand.	Price in cents per foot best bright iron rope. 19 wires to strand.	7 wires to strand.	Price in cents per pound galvanized iron rope. 12 wires to strand.	7 wires to strand.
5½	1¾	100	.....	69	.....	11	10½
5¼	....	90	.....	64	.....	"	"
5	1⅝	80	.....	58	.....	11½	"
4¾	1½	71	.....	53	.....	"	"
4½	....	65	.....	48	.....	"	"
4¼	1⅜	60	60	43	39	"	"
4	1¼	50	50*	36	34	"	"
3¾	....	46	.....	33	.....	"	"
3½	1⅛	41	40	29	27	12	10¾
3¼	....	.....	.....	.....	.....	"	11
3⅛	1″	34	32	26	23	.....	.....
3	....	33	.....	24	.....	"	11
2¾	⅞	27	25	20	19	.....	"
2½	....	23	.....	18	.....	.....	11½
2¼	¾	21	19	16	14	.....	12
2	⅝	18	14	14	10½	....	13
1¾	9-16	17	11	12	8	.....	14
1½	½	15	8	10	7	.....	16
1¼	⅜	.....	7	8	5	.....	17
1	5-16	.....	5	.....	4	.....	18

Discounts, for export in bond, requiring from four to six weeks time, 55%.